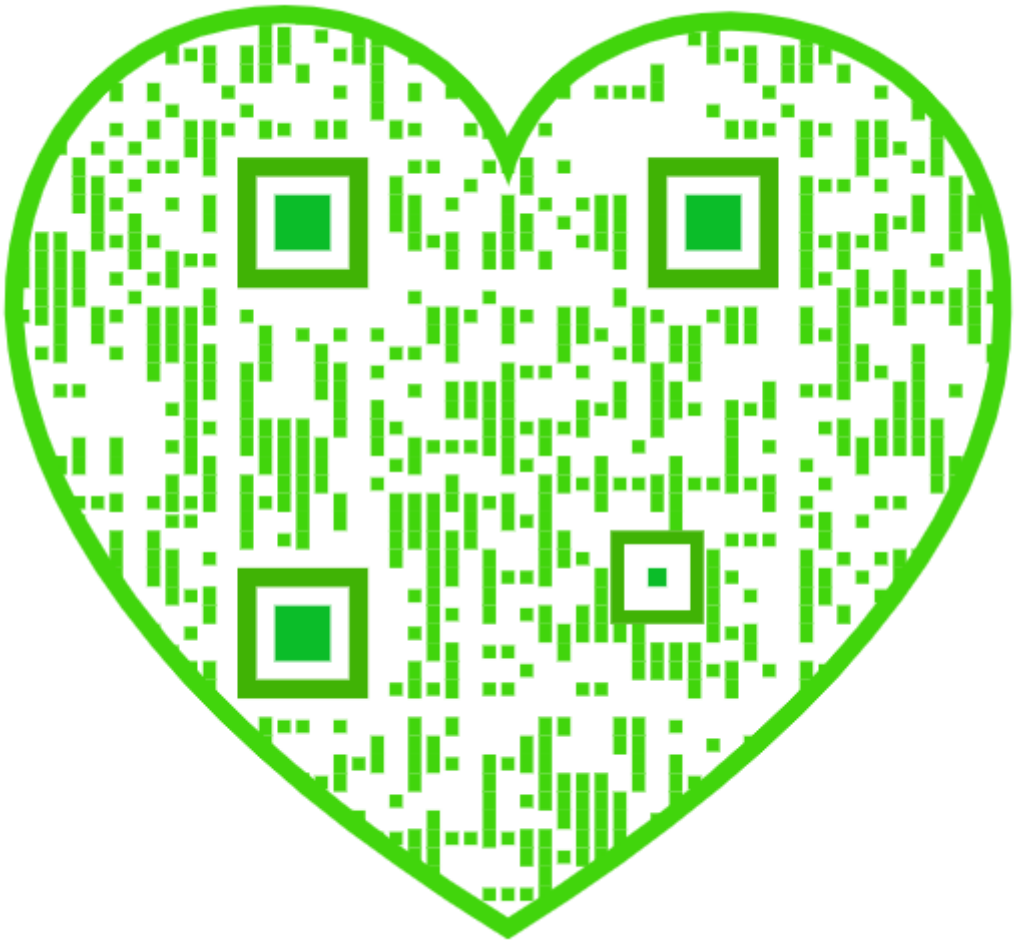

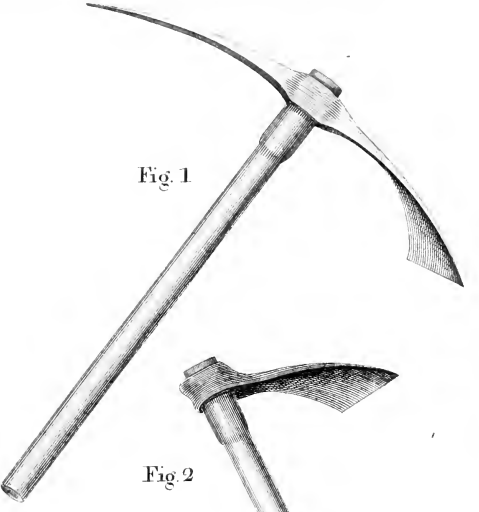

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

THE

PROFITABLE PLANTER.

A Treatise

ON THE

THEORY AND PRACTICE

OF

PLANTING

FOREST TREES,

IN

Every Description of Soil and Situation;

More particularly on

ELEVATED SITES, BARREN HEATHS,

ROCKY SOILS, &c.

Including Directions for

The PLANTING *and* MANAGEMENT *of*

Permanent Screens;

WITH USEFUL HINTS ON

SHELTER AND ORNAMENT.

SECOND EDITION, ENLARGED.

BY W. PONTEY,

ORNAMENTAL GARDENER,

AUTHOR OF THE FOREST PRUNER, AND PLANTER AND FOREST PRUNER TO THE LATE AND PRESENT DUKE OF BEDFORD.

HUDDERSFIELD:

PRINTED for the AUTHOR, by T. SMART;

AND SOLD BY J. HARDING, 36, ST. JAMES'S-STREET; J. WHITE, FLEET-STREET; & J. MAWMAN POULTRY, LONDON.

1808.

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TO THE FIRST EDITION.

THOUGH the writer of the following pages has, for ſeveral years, had conſiderable practice, as a contract planter, he means not to attach more importance to it than that of being enabled, by induſtry and obſervation, to aſcertain principles, which he was previouſly perſuaded were founded in reaſon and nature; nor does he pretend to any ſuperior ſhare of abilities; but, attached to the intereſts of planting, (much more from choice than neceſſity,) he has, from early life, when viewing the works of others, not contented himſelf with ſeeing *that they were ſucceſsful or otherwiſe, but has reaſoned and inquired, in order to diſcover why they were ſo;—and he now preſents a part of the reſult, for the deciſion (and, he hopes, the benefit) of an impartial public.*

On antient planting, — See title "Planting" in Dictionary of Agriculture. —

The following are ſelected from many other

Teſtimonies, in Favour of the firſt Edition.

" We recommend the Obſervations of Mr. Pontey to the Notice of all Perſons, who may be in Situations where they can apply them." *Britiſh Critic, July*, 1801.

" The Directions for the Management of Plantations diſplay great Judgement, and are apparently the Production of extenſive Experience; while the Arrangement of theſe ornamental Additions to a Houſe, in a picturesque View, merit the Attention of the Builder." *Critical Review, June*, 1800.

" Pontey, a profeſſional, and apparently a competent Judge, aſſerts that our own is equal, or rather of the ſame Quality as Foreign Deal." *Modern Land Steward*, p. 345.

" The Author ſeems a Patriot not ſolicitious about his individual Profit, as a contract Planter, but this Treatiſe will recommend him to all who meditate extenſive Plantations."

Agricultural Magazine, Auguſt, 1800.

" A Pamphlet has lately been publiſhed, entitled, a Treatiſe on the Cultivation of the Larch and Scotch Fir Timber, &c. by Mr. Pontey, octavo, which places the advantages attending the culture of this tree, (the Larch) in a ſtrong point of View. And which I recommend to the Peruſal of thoſe who wiſh for further information on this ſubject." *Lambert's Deſcription of the Genus Pinus*, 1803.

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TO THE SECOND EDITION.

As this fecond edition of a work, originally very fmall, has been long promifed, but much longer called for, it may be neceffary to ftate fome reafons for delay:—The very favourable reception of the *firft* edition, naturally put the author upon endeavouring to make a *fecond* more worthy of fuch notice, by extending the defign to the planting and management of Foreft Trees in *general*. In purfuance of which it occurred, that the *latter* fubject was much more imperfectly underftood than the *former*; and hence the propriety of a work devoted *entirely* to that object. Under this impreffion, the whole of his leifure was, for a confiderable period, devoted to the compofition of the "FOREST PRUNER," which was publifhed in December, 1805; a *fecond* edition of which has juft made its appearance. Since the above caufe of delay, many others have occurred, chiefly of a profeffional nature; for he could not confider the *want of time*, a fufficient apology for

fending that into the world, of which he might afterwards be aſhamed.

It will be obſerved, that though the preſent is called a *ſecond edition*, it may be conſidered as nearly a *new work*; the former being chiefly devoted to the cultivation of Larch, and Scotch Fir; and hence, though moſt of the ſentiments are retained, a regard to method, has rendered it neceſſary to write moſt of the work anew.

By adopting the method of treating the different parts of the ſubjects *ſeparately*, much of the confuſion and repetition, common in books on planting, and gardening, are avoided, and the work, of courſe, *much ſhortened*;—a matter calculated, at leaſt, to accommodate the reader. One of the eaſieſt taſks, that falls to the lot of an author, is that of enlarging on ſubjects *generally known*; but this very convenient circumſtance the author has declined, from a full conviction, that, on a ſubject which affords ſo little entertainment, the book which contains the moſt information, in the *leaſt compaſs*, will be the moſt read, and, of courſe, be found moſt generally uſeful.

As the method of moving plants ſomewhat large, or of planting ſingle trees, belongs exclu-

ſively to the buſineſs of *ornamental gardening*, and as the author has ſome intention of making that delightful ſcience the ſubject of a *future effort*, it is here omitted. If he ſhould be found qualified to trace its *principles* to their true ſource, ſo far as to furniſh rules for its *practice*, he will have produced what may be called a chart, equally calculated to direct the *employer* and the *employed*. The truth is, that ſo long as pleaſurable and diſguſting ſcenes remain different, both in their nature and effects, ſo long will the principles of this art remain *ſtationary* and *capable of demonſtration*. That others ſhould hold a *different* doctrine, he does not wonder; *change of taſte* is a convenient apology for perpetual alterations and abſurdities. But if taſte is really founded in reaſon and nature, it will, in a great meaſure, be found *permanent*, and muſt neceſſarily command *general* aſſent. It is, in ſhort, a taſte ſo founded, with a correſponding practice, that the author means to explain and defend ſhould he undertake ſuch a work.

To perſons, who only write *to ſerve the little intereſts of ſelf*, the day of *publication* is naturally a day of *anxiety*;—the author, however, has no ſuch fears; for ſince the ſame means which, in *former inſtances*, procured him *public approbation*, have been uſed in the *preſent*, he has no doubt of experiencing ſimilar ſupport.

ADDRESS.

It is known, that the *united efforts of a few* will frequently effect what may be impoſſible to an *individual*. Under this idea, the propriety of inviting the aſſiſtance of perſons of *induſtry* and *obſervation*, has long ſuggeſted itſelf, as likely to be of eſſential ſervice, in inveſtigating the properties of thoſe ſpecies of Britiſh Timber, *which are not in general uſe*; ſuch as the *Firs*, *Poplars*, and *Willows*. Undoubtedly, the value of any article depends much upon a knowledge of its proper application, or, in other words, of the uſes it is fit for; and certainly no one can aſſert, with truth, that we have more than very *limited* and *vague* ideas of the proper uſes of ſuch timber. We know, that moſt of them may be grown very rapidly, ſome of them on ſoils of very trifling value, and others in a way ſo as to detriment the lands or herbage very little: We know, in ſhort, how *to cultivate* the whole, with abundant ſucceſs; ſtill we can never make the proper uſe of this knowledge, until better inſtructed in the *matter of uſe*. Undoubtedly, different perſons are in poſſeſſion of facts, that would greatly aſſiſt, in elucidating the ſubject, if we had the means of collecting them. And it may alſo be obſerved, that facts, from *different quarters*, muſt produce more conviction than what is furniſhed by *one*, however reſpectable. I cannot ſuppoſe any perſon, poſſeſſing ſuch uſeful information, could wiſh to withhold it; and, therefore, beg leave to ſolicit ſuch communications as may tend to ſhow, for *what purpoſes* theſe ſpecies of timber are proper, or the reverſe. Theſe communications, or, at the leaſt, their ſubſtance, it is intended to print ſeparately, by way of *appendix* to this work, ſo ſoon as a quantity is collected, that ſhall be deemed of ſufficient importance, for that purpoſe.—They will appear either with the writer's ſignature, or otherwiſe, as may be moſt agreeable to himſelf. On ſuch a ſubject it is almoſt unneceſſary to ſay, that no *anonymous* communication can be noticed. The communications may either be addreſſed, by letter, to the *author*, at *Huddersfield*, *Yorkſhire*, or left at Mr. *Harding*'s, Bookſeller, *St. James's Street*, *London*.

Preparation of Soil 16. 19. 122 - to 163.
Distances for sets 163.
Sizes of Sets 169 to 174.
Method of Planting 174 to 180
Miscellaneous observations 180 to the end.

THE

Profitable Planter.

AMONG the different objects of improvement, which present themselves to the attention of persons of landed property, that of Planting will always hold a distinguished rank:—probably, if it were inquired, on which of them a person, so situated, could expend a portion of his disposable income to the greatest advantage, the decision, in at least eight cases in ten, would be in favour of Planting.—Indeed, the matter comes recommended by so many considerations, that it is somewhat difficult to conceive how

any one, in affluent circumſtances, can excuſe himſelf in the total neglect of it.

In addreſſing theſe, I may, for the preſent, omit the arguments uſually adduced upon ſuch occaſions, as motives for Planting, (as part of them will be attended to in the ſequel,) and content myſelf with mentioning, how well this purſuit is calculated to gratify one of the moſt predominant and uſeful paſſions implanted in the human breaſt, namely, a love of poſthumous fame:

> " For who, to dumb Forgetfulneſs a prey,
> " This pleaſing anxious being e'er reſign'd,
> " Left the warm precincts of the cheerful day,
> " Nor caſt one longing, ling'ring look behind?"

Moſt certainly there are few who do not feel an innate deſire, and even an anxiety to be remembered, by poſterity with gratitude:—but, to be ſo remembered as a public character, can fall to the lot of only a few;—nor, in many inſtances, will

the memory of the virtue and uſefulneſs which adorn a private ſtation, even among the higher ranks of ſociety, long ſurvive, except ſome honourable and viſible memorial be left behind;—and what is there that can ſo cheaply, ſuddenly, and certainly effect the purpoſe as Planting? This, at leaſt, is obvious,—whoever plants to a conſiderable extent, becomes a benefactor to his own poſterity and the public; and, therefore, while his work remains, the man will not be forgotten.

The park at Caſtle-Howard furniſhes a very ſtriking proof of the influence of the paſſion alluded to.—On one ſide of a lofty and noble pillar, erected to the memory of the Duke of Marlborough's victories, is the following:

"Charles 3rd Earl of Carliſle, of the "family of the Howards, erected a Caſtle "where the old Caſtle of Hinderſkelf

" ſtood and called it *Caſtle Howard*.—He " likewiſe made the Plantations in this " Park, and all the Outworks, Monu- " ments, and other Plantations belonging " to the ſaid Seat.——He began theſe " Works in the Year 1702, and ſet up " this Inſcription Anno Domini 1731.

" If to Perfection theſe PLANTATIONS riſe,
" If *they* agreeably my Heirs ſurpriſe,
" This faithful Pillar will *their Age* declare,
" As long as Time theſe Characters ſhall ſpare.
" Here then, with kind Remembrance, read his Name,
" Who, *for* POSTERITY, perform'd the ſame."

It is impoſſible to read the above, and contemplate the objects around it, without rendering to the memory of that truly great man abundantly more than he has claimed.—It is, indeed, worthy of notice, that after building what, in compliment to antiquity, he called a caſtle, (but which may more properly be denominated a palace,) with numerous appendages, in a ſtyle of grandeur which has ſeldom

been equalled, (never, perhaps, ſurpaſſed in this iſland,) he ſeems to have expected more credit from his exertions as a Planter than a Builder;—though no one can ſuppoſe the expence upon the former to have amounted to one twentieth part of that upon the latter.

There is, undoubtedly, a great deal more in this inſcription than barely meets the eye;—for does it not operate as a ſtanding reproach, to every ſon and daughter of affluence, who, regardleſs of poſterity, "like ſome poor player, fret and ſtrut "their hour upon the ſtage, and then are "ſeen no more;"—while, to thoſe of an oppoſite deſcription, it whiſpers this ſalutary leſſon, "Go thou, and do likewiſe."

It is among the advantages which the modern has over ancient practice, that what was once conſidered as a great undertaking becomes *now* a mere trifle.—

From the beſt obſervations I have been enabled to make, there ſeems no doubt but the expence which would have planted five acres ſixty years back, would now plant twenty, provided the buſineſs be managed upon a frugal ſyſtem;—and, therefore, if we ſtate the matter as it affects a perſon of landed property, we ſhall find one great reaſon why ſo little of it was done.

If the rental of land have been doubled within the time mentioned, and an acre would then coſt, in planting, four times as much as now, a gentleman muſt then have devoted the rents of eight times as much land to plant an acre, as at preſent; and, where the rent of land is trebled, the difference would be as twelve to one;—of courſe, we ſee ſuch proportion holds out every facility to Planting, while the value of its produce is every where aſtoniſhingly increaſed.

It may here be objected, that the increaſe in the value of land furniſhes an argument *againſt* planting; which is readily admitted, ſo far as lands of a middle value are concerned, and where ſhelter and ornament add nothing to value.—But are there not numerous ſituations, on almoſt every eſtate, which in themſelves produce but little, and mock the darings of the cautious cultivator,—which only require to be planted with judgment, to become abundantly productive in timber?—And are not the ſituations likewiſe numerous, where planting becomes abſolutely neceſſary on account of its ſhelter?—Nor are inſtances wanted where a bare, flat ſurface of country may be ſo diverſified and ornamented, by patches of planting, as to add to the real or ſaleable value of the property, abundantly more than the expence, beſides the marketable value of the wood.—— The neceſſity for planting in the vicinity

of a family manſion will be noticed ſeparately.

Having mentioned ſome of the inducements to plant, I may next advert to the advantages of ſkilful management;—for certainly it may be laid down as a rule, which admits of few exceptions, that the moſt ſkilful is the *cheapeſt planter;* for the following reaſons:

Firſt, Such a one will ſeldom err materially, in regard to the proper ſpecies to be planted on any given ſoil or ſituation.

Secondly, He cannot err in regard to the proper ſize of plants.

Thirdly, He will devote ſo much labour to the preparation of the ſoil, as the particular circumſtances of the caſe render neceſſary, and no more.

I. In regard to the firſt, every one muſt have obſerved what diſappointment and loſs is frequently occaſioned by unſkilful management in that reſpect; and no wonder, if perſons will proceed in the buſineſs without rule, (that is, by reſolving to plant certain ſpecies on particular ſpots, without regarding whether the ſituation be in all reſpects proper or not,) or by the advice of perſons poſſeſſed of neither experience nor obſervation in the buſineſs.—In fact, while men of no experience conſider this part of the profeſſion as ſufficiently eaſy, thoſe of a different deſcription always conſider it as leſs or more difficult, in proportion as the ſoils and ſituations differ from ſuch as they have been uſed to work upon.—If it were not a grating truth, I could produce numerous inſtances, where large ſums have been *waſted* in this way, while the proprietors were unconſcious that they were not pro-

ceeding by the moſt prudent and ſkilful methods.

Secondly,—in regard to the ſizes of plants:—Here again the loſſes of planters have been great indeed.——Leave an unſkilful planter to himſelf, and he generally errs, in uſing plants which are too large; and, conſequently, enhances the riſk and expences, without at all forwarding the buſineſs; while if he proceed by imitating perſons of better ſkill, and plants ſmall ones, but neglects to attend to ſuch circumſtances as the probability of a rank herbage, &c. he may, by that means, have them ſmothered.——Indeed, it very frequently happens, that plants which prove of a proper ſize in one part of a field, are much too large or too ſmall for another; and, therefore, it is evident, conſiderable diſcrimination is neceſſary in this reſpect.

Thirdly, as to the preparation of the III.
ſoil;—moſt certainly it requires a degree of ſkill which few ever have, or ever can, attain;—as it includes a knowledge and due conſideration of very numerous circumſtances, ſuch as, all the various qualities and depths of ſoils, with the different degrees of humidity and expoſure,—the proper ſpecies and ſizes of plants, &c.—all of which ſhould, in a greater or leſs degree, influence the matter of preparation. Undoubtedly, there are caſes where ten pounds would be well expended in preparing an acre of ground for planting; but certainly the caſes are abundantly more common, where one eighth part of the money may well do the buſineſs.—The difficulty reſts in diſtinguiſhing, not only the difference between theſe extremes, but of their intermediate parts; and, therefore, on all theſe grounds, we may ſafely conclude, the moſt ſkilful will generally prove the *cheapeſt* planter.

Conſiſtent with what has been advanced, it is evident, that the moſt profitable planter is he who can manage ſo as to cauſe the land to be moſt productive, at the leaſt expence.——Being well convinced that, in a great majority of caſes, the liberal uſe of the Fir tribe is eſſential to the purpoſe, I ſhall now proceed to examine the opinions and prejudices which have been every where prevalent concerning them, and have hitherto, very unfortunately for the country, prevented their being ſo cultivated as to become generally uſeful, as large, ſubſtantial, and valuable timber.

The man of ſcience, in common with the carpenter, knows the uſe of an oak or an aſh, but, with reſpect to Engliſh-grown Firs, generally contents himſelf with the received idea, that *they are of little value*; and hence it is only of late that they have been extenſively cultivated

for profit;—previous to which, though much had been written, on the planting of oak, aſh, &c. for timber, we were commonly *taught* to conſider the planting of firs as principally for ſhelter or ornament.

Since the time that the foreign fir timber was firſt introduced into this country, its uſefulneſs and conſequent reputation have been conſtantly increaſing; and hence we import, annually, immenſe quantities, at an enormous expence:—the facts are indiſputable, though it does not admit of a doubt that the ſpecies, ſo highly valued, will grow extremely well here. A circumſtance ſufficient to induce the reflecting mind to inquire, whether it be not poſſible *to avoid the greater part, if not the whole, of that expence*, by extending and improving their Culture; and to feel aſtoniſhed, that a ſubject of ſuch immenſe importance ſhould have hitherto met with ſo little attention.

The motive for ſuch inquiry will be greater, when we ſeriouſly reflect on the preſent ſcarcity, and conſequent advance of price; and our ideas will probably turn to the day, not long elapſed, when Fir Timber was ſold at little more than one third of what it now is. Indeed, ſo long as we depend upon foreign markets for a ſupply, it is impoſſible to foreſee what means *may* be uſed, and what circumſtances *may* ariſe, to increaſe ſuch ſcarcity; conſequently, impracticable to form any opinion of the *price* that *may be exacted*, or the *inconveniences* and *injuries* which the want of ſuch Timber may produce.

Whoever has attentively examined the ſubject; and has the *intereſt of the nation at heart*, muſt certainly ſee the neceſſity of thoroughly inveſtigating, whether there be any thing, in the *air* or *ſoil* of our country, to prevent the growing of *good fir timber*.

That we have few Engliſh-grown firs of ſufficient ſcantlings for the larger purpoſes of building, will readily be admitted;—but whence proceeds the deficiency?—Prejudice ſays, "we cannot grow "them *good;*" and ignorance and indolence have hitherto very generally aſſented to the aſſertion. But ſhould it be found that ſuch concluſions are contrary to truth, and that the ſcarcity in queſtion is the conſequence *only* of erroneous notions, it will certainly be uſeful to expoſe them, to trace their cauſes and effects, and to furniſh thoſe obſervations which experience has ſuggeſted; for theories, however plauſible, are by no means the *guide*, a prudent man ought to follow, in the ſcience of planting and growing timber; becauſe, while ſatisfied with commonly received opinions, though it is probable we may be right, there is a chance of our being wrong; and he is a very inattentive obſerver, who, acting as a plan-

ter of firs, does not diſcover, that, if men had not uſually taken their ideas upon truſt, the buſineſs muſt, long ago, have been reduced to ſomewhat of certainty.

They would have found out, not only what firs grow beſt in particular ſoils and ſituations, but the ſpecific ſorts which thrive in moſt of them; and, moreover, would clearly have aſcertained the properties of the timber of all, or at leaſt of ſo many of them as would thrive on bleak and barren ones, and, therefore, likely to be moſt profitable. But, unfortunately, inſtead of having got thus far on the road of knowledge, very few have yet made any progreſs; and, what is worſe, many ſee not yet the neceſſity of ſuch a journey.—In ſhort, they have no idea of reaping any advantage from it*; why,

* The author has very great pleaſure in obſerving, that ſuch inattention, which might be conſidered as

therefore, ſhould they labour for that which cannot profit?

Of the truth of theſe remarks we have ample proof; for the planters of the laſt age generally uſed Scotch Firs only, in a manner that leaves us at a loſs to diſcover what end they had in view, unleſs it was the rehearſal of their own funerals; certainly, if their object was uſe, ſhelter, or ornament, they in a great meaſure miſtook the means.

That the planters of the preſent age greatly ſurpaſs thoſe of the laſt, is acknowledged; as they generally uſe ſo much of variety on every ſoil, that, enough of the proper ſorts may ultimately

highly diſgraceful, is *now*, in ſome meaſure, done away; as planting of Firs, with the direct idea of profit, is practiſed to an extent hitherto unprecedented; of courſe every ſpecies of information, tending either to facilitate or elucidate the buſineſs, muſt be highly acceptable.

be ſelected for Timber:—ſtill ſuch variety affords no proof of ſkill, but the contrary; as is abundantly ſhown by the methods moſt frequently adopted in thinning; the *moſt valuable* being uſually cut down, to make room for the *moſt worthleſs.*

The reader will obſerve, that, by the moſt *valuable*, I mean ſuch as would be worth the moſt money in a given time, (ſuppoſe thirty years;) and by the moſt worthleſs, ſuch as would produce the leaſt in the ſame period:—quantity and quality being out of the queſtion, except as they affect the price.

I would premiſe further, that, conſiſtent with the preceeding, I pay no regard to eſtabliſhed opinions; for, ſhould I find even the oak and aſh mixed with larch, Scotch and ſpruce fir, and the former making but little progreſs, while

the latter were flouriſhing, I ſhould not hesitate to call them inferior;—nay, were both in a thriving ſtate, yet, if it ſeemed next to certainty that the former would not fetch ten pounds, when the latter would be worth twenty, I ſhould treat them only as objects of ſecondary importance.

If the foregoing be the only true method of eſtimating the value of trees planted for profit, it is evident that the modern planters, with every few exceptions, have acted upon miſtaken principles, and muſt continue to do ſo, till better acquainted with the qualities of larch, Scotch, and ſpruce fir timber.

Undoubtedly, till a very late period, Engliſh firs have been conſidered as of little value, except for ſhelter and ornament; and hence the undiſtinguiſhing havock to which they have been ſubjected:

indeed, it is not at all to be wondered at, when we conſider that not a few writers, who have undertaken to direct the current of public opinion, repreſent them (in addition to the above purpoſes,) as beſt of all calculated for the *honourable* and *permanent* ſituation of *Nurſes*.

Seeing then the conſequences to which ſuch opinions directly lead, and being perfectly convinced they are equally unfounded and detrimental, it may be uſeful to advert, ſhortly, to the leading cauſes from which they ſeem to have obtained currency;—and eſpecially ſo, as moſt workmen are ſo completely prejudiced as to be unwilling to give the article a fair trial.

To meet ſuch ideas, however, we may conſider that, for many years, the Scotch firs were the only ſpecies commonly planted; and theſe at very conſiderable diſtances; in conſequence of which, they would

retain their lower branches till they got very large; and hence the timber, upon being cut up, is uniformly found ſo full of Knots, as to be diſqualified for moſt purpoſes to which foreign fir has been uſually applied, and therefore the article deſervedly fell into diſrepute.

When the above truly barbarous taſte ſubſided, we find the Scotch firs again exhibited *alone*, either in maſſes or ſmall clumps; where each plant, having leſs ſpace, would grow much leſs knotty than before; and hence a temptation to uſe ſuch as were thinned out while young, for numerous purpoſes.—But here unfortunately it ſeems to have been overlooked, that this fir, in a ſheltered ſituation, grows very quickly for many years; and never acquires much of denſity in an early ſtage of growth.—moſt certainly neither of the deſcriptions adduced were fit to be put in competition with

Foreign Deal; and yet it may ſafely be aſſerted, that a large proportion of the latter deſcription, with a very ſmall one of the former, compoſed at leaſt nine-tenths of the documents upon which public opinion was formed, previous to the laſt ſix or ſeven years.

Good ſometimes ariſes out of evil, and ſo it has happened here; for the extravagant price of foreign fir has of late induced many people to make trial of ſome of the beſt trees in their poſſeſſion, of different ſorts; and the reſult has been ſo far favourable as to occaſion much of the extraordinary increaſe in planting which has been noticed.

In the buſineſs of inveſtigating the natural properties of Firs, (to which a conſiderable degree of my attention has been devoted for ſeveral years,) it has afforded ſingular ſatisfaction to find them uni-

formly ſuperior to what previous preju- English
dices had taught me to expect. In truth, after a careful examination of every ſpecimen that has fallen in my way, up to the preſent period, (January, 1807,) I can ſafely affirm, that I have diſcovered no *natural defect*, which will, ultimately, diſqualify any of the ſpecies, commonly cultivated, from being uſed, either generally or partially, as a ſubſtitute for the foreign.

It is true that, with reſpect to the Scotch and Silver Firs and the Weymouth Pine, the young quick-grown wood is ſomewhat ſoft or ſpongy; but does not ſomething like this prevail in ſeveral parts of both the vegetable and animal creation, without at all impeaching the ſtrength or value of the matured ſubjects of either? Certainly, in regard to the firs in queſtion, every obſervation has ſhown that the Timber improves with age, probably in

the ſame proportion as the growth decreaſes after a certain period.

Obſerve, it is not ſaid that even ſuch young timber would not be durable if properly ſeaſoned, and uſed where conſtantly dry; as I conceive theſe points are by no means aſcertained:—but were ſuch the caſe, we have others, namely, the Larch and Spruce Fir, which, if properly managed, may ſafely be depended upon, as durable, in every period of their growth; whether expoſed or otherwiſe; and, therefore, no queſtion or doubt needs be entertained, as to their liberal uſe for every purpoſe, where they can be procured large enough.

It has fortunately happened that, in the courſe of the laſt five or ſix years, the Larch has got into conſiderable repute; as wherever a quantity of it is to be ſold, from the ſize of a common rail upwards,

it never fails to command purchaſers, at a good price. This may be conſidered as one of the caſes where general opinion can ſcarcely be ſuppoſed to err; becauſe it has been corrected by experience.

Formerly, no diſtinctions uſed to be made;—ENGLISH FIR, was the general name for the whole ſpecies; and the idea it conveyed was that collected from the uſe of Scotch Firs only. NOW, almoſt every purchaſer has ſome idea of diſtinctions; which could only ariſe from ſome evidence of difference in value:—In ſhort, almoſt every one gives the Larch a decided preference over them all, though, perhaps, few perſons have more than very confuſed ideas of its ſpecific properties.

We need not here adopt the ſtale method of extolling the Larch upon the credit of antient authors, who ſeem to have imitated each other, in detailing circum-

ſtances too ſurpriſing for readers of common underſtandings to believe; eſpecially as ſome of their ſtatements have been found completely erroneous*; but we may ſay, that experience has warranted an opinion, that the Larch is equal to the Foreign, for all the general purpoſes to which that article is uſually applied, and ſuperior to it for many others, among which are the following:

Firſt, It may be grown abundantly clearer of knots, provided ſome little attention be paid to pruning it. Every one knows that the Knots in Foreign Timber affect its value, exactly in proportion as they prevail in number and ſize; as both

* Many old books tell us, that the Larch will not burn, which is falſe: for though it does not burn ſo freely as other Firs, it burns quick enough to be ranked among the beſt ſorts of wood fuel; and hence, where ſuch is uſed, the faggots are much eſteemed, as being *a good and durable* article.

have a tendency to affect its ſtrength and appearance.

Secondly, It is much tougher;—a circumſtance which, connected with its durability, will fit it for numerous purpoſes, in boards of the leaſt poſſible thickneſs.—Three eighths of Larch muſt, in almoſt any caſe, be ſuperior to half an inch of Foreign Deal.

Thirdly, Suppoſing it once well ſeaſoned, it is afterwards much leſs liable to ſhrink.

Fourthly, It may be ſpeedily ſeaſoned, at any time of the year, as it admits of a very conſiderable degree of heat, without endangering its cracking.

Fifthly, It is much ſuperior in colour; as the application of raw linſeed oil only, turns it to a beautiful nut-brown.

It likewiſe admits of being ſtained to reſemble mahogany; and takes a poliſh equal to box, holly, or even ſatin wood; ſo that it is proper for numerous articles of uſeful and ornamental furniture, to which the foreign deal is perfectly inapplicable.

Sixthly, It is again ſuperior, as it is proper for poſts to put into the ground. In this caſe, however, it is to be noted, that only young trees, of a proper ſize, ſhould be uſed: and the part intended to ſtand in the earth ſhould have the whole of the bark left upon it.

Seventhly, It is clearly ſuperior in the important point of durability, when expoſed to the weather.

Probably the ſhorteſt and cleareſt way of proving the point is, by referring the reader to the conſideration of the rotten Knots ſo frequently found in Red Deal;

an article which is univerſally allowed to be ſuperior to the White, when expoſed in boards to the influence of the atmoſphere. Theſe knots are certainly the remains of branches, which rotted while they ſtill hung upon the trees:—but nothing like this is ever found in a Larch board, or on a tree; though we are ſure the latter has been ſubjected to expoſure as well as the former.—To this fact (in its own nature more convincing than aſſertion from any quarter,) I will only add, that every obſervation I have made has tended to impreſs the ſame idea as is uſually entertained of the heart of oak. We know that it muſt decay at ſome period, though we have no certain method by which to gueſs—*when* *.

* Snch perſons as feel particularly intereſted in underſtanding the properties of Larch, may find the ſubject diſcuſſed, conſiderably more at large, (with an account of ſome experiments,) in *The Foreſt Pruner*, p. 79.—107.

The Spruce Fir being conſidered as next in value to the Larch, naturally calls for the next attention. Perhaps we may lay it down as a maxim, in regard to trees generally, that the utmoſt attention ſhould be paid to aſcertaining the properties of ſuch as are found to grow freely in a great variety of ſoils and ſituations; becauſe theſe circumſtances hold out an almoſt irreſiſtible inducement for perſons to plant them freely; and hence, though in general good is done, in ſome caſes conſiderable damage may enſue.

The caſe of the Spruce Fir particularly calls for ſuch attention, as it grows rapidly on almoſt every deſcription of ſoil, from a very ſtiff loam, and ſuch as poſſeſs a conſiderable degree of humidity, to a very dry ſand; provided the ſituation be not very much expoſed.—It will readily be admitted, that the tree is exceedingly ornamental; but, with regard to the pro-

perties of its timber, very little appears to be known with certainty.

As to myſelf, I readily confeſs that, till a late period, I did not diſcover in it any ſtriking proofs of ſuperiority; and hence, upon former occaſions, I paſſed it over ſomewhat ſlightly;—now, however, the caſe is different, and, therefore, I take the earlieſt opportunity of giving my reaſons for ſuch change in opinion.

In obſerving the ſtate of this fir, in plantations where the trees formerly grew thickly, and never were pruned, it appeared a very ſtriking circumſtance, that branches which had evidently been dead many years, (ſome of them probably more than twenty,) were found, uniformly, not only *found* but *tough*;—a convincing proof of DURABILITY. Still I believe this circumſtance, which, properly improved, *ought* and *would* have eſtabliſhed

its reputation and uſe, has operated directly to the *contrary;* becauſe wherever the trees ſtand ſo thin as that their lower branches can grow to a conſiderable ſize, theſe continuing attached to the ſtems for many years, (whether living or dead,) muſt inevitably cauſe them to grow extremely knotty, and hence to be rejected for general purpoſes.——Indeed, we cannot wonder if workmen uſe their utmoſt influence in depreciating an article ſo extremely difficult to work, in compariſon with foreign timber, and which, in addito being tedious, not unfrequently damages their tools; all which would be completely avoided by means of pruning.

It is now more than twelve months ſince my attention was particularly attracted to the ſubject, as above; during which time many obſervations have been made; all of which tended, directly or indirectly to confirm my opinion of its

durability, whether uſed in expoſures or otherwiſe; with the exception of the caſe of trees uſed WHOLE, as rails, &c.—as in drying they never fail to crack; and hence the part is expoſed to alternate drought and moiſture; againſt which not even the heart of oak is completely proof.——As far as my obſervations have extended, the ſame remark will apply in regard to rails made of *Green Whole Wood*, of every deſcription.

The ſpecimen of Spruce Fir which accompanies this treatiſe, is part of a beam, that had been in a building about twenty-four years; which, on being taken out, proved as ſound (the bark included) as when firſt made uſe of;—nor did its appearance leave any reaſon to ſuſpect it to be leſs ſtrong or durable, or at all inferior to any foreign beam whatever. Yet a point ſtill more important remains to be noticed:—IT WAS NOT OLD WOOD.—Its

Spruce diameter being eighteen inches, under the bark, where its age was fifty years.

Here then let us pauſe a moment, to conſider what uſe prudent planters ought to make of the important fact juſt ſtated: in doing which, it will readily occur, that the matter is of too much conſequence to be fully credited and acted upon, without further inveſtigation; and, therefore, it is incumbent upon them to uſe every means within their power, to collect ſuch facts and documents as may tend to eſtabliſh or diſcredit it:—This is all I deſire or want; for if men will only be earneſt in this ſort of inveſtigation, no further arguments will be neceſſary from me, to induce them either to plant, prune, or preſerve the Spruce Fir.

But there is another point of view, in which the article is extremely valuable; namely, as being (all circumſtances conſi-

dered) the beſt plant we have for the general purpoſes of ſhelter; as it grows cloſe, and, in proper ſituations, very quickly. Where it has free ſpace, it retains its lower branches alive to the ground, to the utmoſt period of its exiſtence; ſo that we can eaſily avail ourſelves of its ſhelter to any moderate extent. This tree naturally forms itſelf into a narrow cone; its breadth, however, may be eaſily increaſed, by cutting off its head; or readily reduced, by pruning, without materially injuring its foliage:—Indeed, its form is ſo much ſubject to management, that I have ſeen it ſhorn, ſo as to form an excellent ſheltering hedge.

Of the innumerable caſes in which this tree may be uſeful, as a ſhelter, it is neither poſſible nor neceſſary to ſpeak here; but I ſhould conſider myſelf inexcuſable in omitting to notice one, in which it is qualified to be moſt eſſentially ſervicea-

Spruce ble; as it materially concerns a deſcription of perſons who are particularly entitled to attention and reſpect,—I mean the planters of oaks.

Planting of firs among oaks, as well as other deciduous trees, in order to ſhelter and draw, or perhaps, more properly, to force them up, has long been practiſed; yet, I conceive, it has been little conſidered how far the Spruce is ſuperior to the Scotch Fir for general purpoſes. The point, however, appears ſelf evident, from what has been advanced, with the additional circumſtance, that the former will retain its lower foliage, in leſs than half the ſpace which the latter would require; and, therefore, that part of its ſhelter cannot be laſting, except we are willing to ſacrifice much ſpace, and content to grow it as faggot wood only;—while, as to the other, the ſpace required would be very moderate, the ſhelter complete and dura-

ble, and the wood, ultimately, of confi- Spruce
derable value.

Where the air has ſomewhat free ſcope round an oak, it produces numerous ſide branches; ſome of which ſwell, ſo as to rival the principal leader,—which a complete ſhelter is directly calculated to prevent; as a branch never either ſwells or ſhoots freely if it do not point into an open ſpace. In the growing ſeaſon, every tree becomes a traveller, in ſearch of air and light; and, therefore, they never tower ſo rapidly as when they have the moſt of both above them.

But there is another conſideration, which of itſelf ought completely to influence the choice of trees planted for Nurſes. The very name conveys the idea that they are to be diſplaced, at no diſtant period; and, therefore, common ſenſe ſeems to dictate that, in every poſſible caſe, they

ſhould be of ſuch ſorts as are moſt of all valuable at an early ſtage of growth; properties which are common to the Larch and Spruce Fir; and, therefore, they ſhould be preferred in that department, wherever the ſoil and ſituation proves ſuitable.

Certainly when an oak planter (conſiſtently with the laſt hint) makes uſe of ſuch Nurſes, he goes far to obviate any poſſible riſk; for ſhould the oaks not grow to expectation, it is highly probable one or both of the others might anſwer, or even exceed it; and thus a crop of excellent timber would be ſecured.

I know only one objection that can be fairly urged againſt the general and liberal uſe of Spruce Firs, as Nurſes and Principals, which is—their *price*. Hitherto they have been uſually conſidered as more ornamental than uſeful; and

hence, while the conſumption has been ſmall, the price in nurſeries has been kept rather high.——It may ſeem a paradox, but ſtill it is a fact, that, as the demand for any ſpecies of foreſt trees increaſes, the price decreaſes, till it becomes very moderate:—nor is the trade any loſer by it; as an increaſed demand, frequently aided by an improved mode of culture, ſeldom fails to more than cover the difference.

Conſidering what has been advanced, in regard to the properties of the Spruce Fir, it is preſumed, that little doubt can be entertained of the propriety of prefering it to the Scotch, on every ſoil and ſituation equally proper for both: a caſe very common, though by no means univerſal. The leading exceptions, which I have obſerved, are a black ſandy and mooriſh ſoil, that naturally produces nothing but heath, and very bleak expoſures. On the for-

mer they ſeldom vegetate more than juſt to keep them alive; in the latter they grow better, but too ſlowly to render it deſirable to plant them. As the firſt ſort of exception is, in a conſiderable degree, applicable to the Larch, and the latter to trees in general, it has long been an object of much ſolicitude with myſelf, to find means to reduce them within the leaſt poſſible limits; the reſult of which will be ſeen when we come to treat diſtinctly of the *Methods* of Planting and obtaining Shelter.

But preſuming that, after all which has or can be done, in regard to the circumſtances juſt mentioned, numerous and extenſive tracts will remain, upon which the Scotch Firs ought to predominate, I ſhall next proceed to notice its properties.

Writers in general ſeem agreed, that this tree is of the ſame ſpecies as that from

which we have the foreign Red Deal;—and, if ſuch be the fact, little doubt need be entertained of its latent good qualities; notwithſtanding the diſgrace under which it labours;—and as to the matter of affinity, I ſee no reaſon to doubt it; the order in which the knots are placed, their liability to rot, and the teſtimony of individuals who have viſited the countries from which we import that article, all ſeem to tend to eſtabliſh the point. Still the one is uſually found of a much finer grain, and much heavier and ſtronger than the other;—which is clearly imputable to its being grown in a colder atmoſphere, and, conſequently, much ſlower than ours. The real difference, however, is only in appearance, when two old ſubjects happen to be contraſted; as then the queſtion of weight and ſtrength depends more upon the part of the trees from which the ſpecimens are taken, than the country from which they come.

If it be true, that we can raiſe abundance of the article, upon almoſt every deſcription of ſoils, which are nearly or altogether unproductive; and if it be clearly aſcertained, that knottineſs and want of denſity are the only defects of the article; it muſt likewiſe be true, that, diſcovering the means of preventing them, becomes not only an individual but a *national concern.*——It may be eaſy, in ſome caſes, for an author to detect error, but it is indeed herculean labour to induce the bulk of mankind to adopt its oppoſite.

It has already been intimated, that the knottineſs of fir timber, generally, would eaſily be prevented by a good method of pruning;—(for proof of which, the reader is referred to *The Foreſt Pruner*;)—and, therefore, it remains only to be conſidered, how far the want of denſity is curable by any means ſhort of age; for that is evidently its moſt natural one.

Probably we may here gather a useful hint, from what is said to be the practice in Russia and Sweden, namely, the disbarking of the stems of the firs, to the length of two or three feet, at least a year before they are intended to be taken down; which disbarking and falling is done only in winter; a practice which could not have generally prevailed, on any grounds short of admitted utility.

If we could show clearly in which way such method operated, a very important point would be gained; but as that seems impossible, I shall dismiss it with just observing, that if it could be found that, under such operation, the last efforts of lingering life would be spent in expelling the watery matter, or in expending it to support the foliage, and substituting rosin in its place, we should then have sufficient data on which to found a system for the

improvement of every ſpecies of young fir timber.

We certainly ſhall ſoon have a large ſupply of this deſcription; and, therefore, the ſtudy of its improvement and properties becomes matter of more than common intereſt. Experiments, to elucidate this important point, ſhould be made, again and again, by perſons who have means and leiſure, on free-growing trees of different ages.—From what I have obſerved, of the ſuperior quality of the wood of young ones, which have been, for ſome time, ſtinted in growth, (in conſequence of ſudden expoſure, or being overhung by others,) I have great reaſon to ſuſpect, that cutting off nearly the whole of the branches, two years before the period of taking down, would go far to effect the needed improvement; as, after the operation, they would grow very ſlowly.—Obſerve, this being an extreme caſe, the branches ſhould be taken

off not leſs than ſix inches from the ſtem, to prevent bleeding.

It may here be obſerved, as a general remark, that though building timber is uſually cut from large fir wood, (ſuch being nearly as cheap as the ſmall,) ſtill but little of it is uſed in large ſcantlings; and, therefore, it is evident, that by much the greater part of a modern building may be done with ſmall ones; and hence native produce might be liberally made uſe of in them, at a much earlier period than is generally imagined. Great ſtrength can be required only in a few caſes, eaſily provided for; Durability becomes eſſential in all: and, therefore, we may ſtate it as a queſtion, well worthy of general diſcuſſion;—Under what circumſtances may the durability of Britiſh-grown Fir Timber be ſafely depended upon?

I need not dwell long on the facility with which the Scotch Fir accommodates itſelf to almoſt every deſcription of ſoil and ſituation.—It may, indeed, be called "The Planter's Forlorn Hope;" as where it fails, the caſe is truly deſperate. For inſtance:—it is planted with ſucceſs, on the moſt barren commons, where no other tree or plant (the Heath excepted) will grow. On ſcites which are elevated, and expoſed to particular currents of wind, it often proves the only tree that can be got up, except ſo far as others may riſe under its ſhelter. In the ſea breeze too, it is frequently obſerved that, while every plant around it bends from the blaſt, as if ſeeking protection, this holds its head erect, and bids defiance to the noxious gale.

It is not ſaid, however, that, in any of theſe caſes, the trees grow uniformly as quick as under more favourable circumſtances: ſtill it is truly wonderful to ob-

ſerve the quickneſs of their progreſs, after they have got ſufficiently eſtabliſhed in the ground, and are large enough to ſhelter each other.—Why they do ſo on a barren heathy ſoil, it is not eaſy to conceive; all we know with certainty is, that this tree will not only live but thrive, where moſt others would do neither.

In the caſe of expoſures, where the ſoil is tolerable, the reaſons for ſuch thriving are ſomewhat obvious. The plant is not only extremely hardy, by nature, but its ſhoot and leaf (ſpine) are ſtiff; and hence neither can be much ſubject to damage from violent winds;—ſtill, in ſuch caſes, it never grows rapidly till each plant, by contributing a part to the general ſtock of ſhelter, reſiſts the winds and improves the atmoſphere; and hence their accelerated growth.——It is admitted, that ſuch ſhelter could not be laſting; but it would afford the means of rearing a durable one,

conſiſting of every thing proper for the purpoſe. And thus, by the uſe of this degraded plant, we ſee the eaſy means of doing what would be otherwiſe impoſſible, namely, rearing a Crop of Timber, of any deſcription proper for the ſoil, in elevations which, naturally, would grow ſuch trees no better than buſhes. The value of ſuch ſhelters, as they affect the ſurrounding lands, will be attended to under a ſeparate head.

Clear ideas of what will grow and thrive upon the ſituations juſt mentioned, are eſſentially neceſſary to almoſt every one who plants upon a large ſcale; and, therefore, an author, who can diſtinguiſh between truth and error, would ill diſcharge his duty if he did not, to the utmoſt of his power, enforce the one and oppoſe the other.——In a modern book on planting, now in many hands, we have the following, " The native Pine (Scotch

" Fir) has long been planted as a nurſe,
" but the practice is now much relinquiſh-
" ed. Nor is it founded in reaſon; ſince
" there is no ſoil or ſituation in which
" the Larch and Mountain Aſh will not
" far ſurpaſs it in growth, while young."

Obſerve the latitude of the paſſage,—
" *No ſoil or ſituation*," &c.—Still I will venture to affirm, that whoever ſhould plant any of the heathy parts of the chain of hills which ſeparates Yorkſhire from Lancaſhire, Cheſhire, and Derbyſhire, in the manner implied as above, would find, to his coſt, that this "*Practical Planter*" had reckoned without his hoſt; as *neither his nurſes nor his nurſlings would grow*, except ſo far as the Larch might happen to penetrate into the under ſtratum (a ſort of reddiſh ſand, full of looſe ſtones;) where, *if the ſituation were not much expoſed*, it might make tolerable progreſs; but certainly not otherwiſe.

What I have juſt advanced ſtands upon very different grounds from either mere theory, or ſlight, or recent practice; for I have been annually employed in planting upon the ſaid hills for, at leaſt, ſixteen years; during which, no inſtance has occurred of the Larch doing more upon the heathy ſoil than juſt growing enough to keep alive, till it penetrated the under ſtratum. And though experiments have been repeatedly made, by planting the oak, aſh, ſycamore, and birch, (moſt of which produced a few leaves the firſt ſeaſon,) the plants have all died; except a few (probably not more than one in a hundred) of the latter; and their progreſs has been very ſlow.

But, again:—It will ſcarcely be doubted, but a great proportion of the heathy ſoils in the country are ſimilar, both in appearance and compoſition, to the foregoing; and, therefore, we may conclude,

Heathy Soils.

that, ſo long as like cauſes produce the ſame effects, they *alone* will not produce deciduous trees:—indeed, the heathy ſoils about Woburn ſtrongly confirm the fact; for there great quantities of ſuch trees, of almoſt every deſcription, had been planted, (the Mountain Aſh included,) previous to my engagement; of which, none have grown except ſo far as they have penetrated into the under ſtratum, where the heathy ſoil happened to be thin; and, among them, the Larch has ſucceeded beſt. Many of theſe, however, have remained completely covered with moſs, and nearly ſtationary, for many years; yet moſt of them have, at length, recovered gradually; which could only happen in conſequence of their roots getting into the under ſtratum:—for ſuch as were planted in pits, or broken ground, grew well from the firſt.

But enough of heathy ſoils;—let us ſee if, haply, our author has been more

correct in regard to expoſed and elevated ſcites; where, of courſe, *the moſt perfect ſhelter* is abſolutely neceſſary.

Here we may aſk any one accuſtomed to obſervations on ſuch ſubjects, if he ever remarked the Larch to be as little affected by the winds as the Scotch Fir, on ſuch ſituations?—And again, Do not deciduous trees conſtantly extend their branches horizontally, ſo as readily to intermix with each other?—but they cannot do ſo with the Firs; as there is little of either light or air in their interior; and, therefore, when mixed with them, ſuch can only ſhoot freely *upwards*. Beſides, the Larch, for ſeveral feet from its top downwards, has a very light ſpiral head; of courſe, *there* its ſhelter bears no compariſon to the Scotch Fir, at any ſeaſon.

The abſurdity of planting the Mountain Aſh, as a ſhelter, will be evident, by

onſidering, that if it grow faſt it produces but very few branches; and if it grow ſlowly, ſo as to produce more, it will be too low to afford protection. At beſt four of this plant would not ſhelter near ſo much as one Scotch Fir; and, what is worſe, four of the former would coſt more than eight of the latter; and, after all this extra expence, we ſhould neither have a tolerable ſhelter, nor (if our author is to be credited,) a timber tree of value. He ſays, in deſcribing its properties, "As a "timber tree, however, it is of little uſe; "being only valued by the wheel-wrights, "to which they prefer Birch and Beech."

Preſuming that the uſeful inferences from the foregoing cannot eſcape the attentive reader, I ſhall cloſe my obſervations on the properties of the Scotch Fir with remarking, that heathy ſoils and elevated ſituations compoſe, jointly, at leaſt half the land likely to be planted for pro-

fit in this country; and, therefore, conſidering that, in addition to its other properties, it is the only plant which will thrive on the one, and the beſt primary ſhelter on the other, it muſt always be regarded as one of moſt extenſive uſefulneſs*.

* The following is a ſtriking, though by no means a ſolitary, inſtance of prejudice, in regard to Scotch Fir Timber.

A gentleman, who had a quantity of large trees on ſale, brought me a ſample; obſerving, that "it "fetched only a very low price." As the timber ſeemed in every reſpect good, except being ſomewhat knotty, in conſequence of having been grown in the manner noticed at p. 28, it ſeemed evident to me, that neither the ſellers nor buyers had more than very inadequate ideas of its value.——In order to try this point, in regard to the former, I had a converſation with the perſon employed to fell it, in company with the owner, on the properties of the Fir wood produced on that eſtate; when he expreſſed his decided opinion, that "the Scotch Fir wood was very indifferent in quality." However, on producing the above-mentioned ſample, he (not knowing where it had been grown) declared it to poſſeſs "all the natural properties of Capital Tim-

It would be thought ſomewhat foreign to the preſent ſubject to enlarge on the properties of the other firs, commonly cultivated as plants which are more ornamental than uſeful; ſuch as the American Spruce, Silver Fir, Weymouth Pine, Pineaſter, &c. as all of them are dear, ſome tender, and others apt to fail on being removed;—ſtill, as they are highly ornamental in proper ſituations, and as every plant which is ſo adds ſomething to the real or marketable value of a place, they clearly belong to the ſubject, and will continue to do ſo, as long as taſte and nature ſhall equally contribute to the

" ber; and that he had great doubts if any ſoil in this " country would produce its equal."——This was the more remarkable, as he was then in the daily habit of ſuperintending the ſawyers, who were cutting up trees of the ſame age, and grown on the ſame ſpot of ground; many of which, being ſmaller in ſcantling, were, of courſe, finer in grain, and more denſe than the ſample produced.

formation of ornamental gardens. Of the properties of their timber, however, I have little to remark, except that, in every cafe, its denfity feems to increafe with age; and if, as we have abundant reafon to believe, the durability of fir wood depends principally upon the refinous matter found in it, there is no doubt but all of them might be ufed for numerous building purpofes, after having attained a reafonable age.

In a book profeffing to develope the principles of profitable planting, there feems much propriety in particularly noticing fuch trees as are in themfelves highly valuable, but which, from different caufes, are either not generally known, or not in merited reputation. The fpecies now alluded to are—the Witch Elm, the Huntingdon Willow, the Upland Willow, the Black Italian Poplar, and the Hoary Leaved Poplar or Abele.

Firſt, *The Witch or Scotch Elm*.—This tree is well known in ſome parts of the country, where it grows ſpontaneouſly; though but little in others, where it does not;—as planters have generally conſidered it either as an inferior article, or as one likely to do miſchief in plantations, from its quick and ſtraggling manner of growth: nor do they ſeem to have at all conſidered, that if not the firſt in point of hardihood, it certainly is one of the ſecond; and the ſame may be ſaid in regard to the variety of the ſoils in which it grows freely.

The weſtern part of the weſt-riding of Yorkſhire is rather proverbial, for the coldneſs of its atmoſphere, while much of its ſoil is retentive and thin, upon a clay bottom. On theſe, where the appearance of moſt other trees proclaims the want of proper accommodation, the lengthened ſhoots and increaſing trunks

of this evidently evince the contrary.—Certainly on every ſituation and ſoil, not peculiarly bleak or ſteril, it is a quick grower; while it would appear, that its timber is quite as good, if not better, than the other ſpecies of Elms; and, therefore, one would ſuppoſe it merited general attention.

It has happened, however, that, in addition to the awkward mode of growth already noticed, there is a very prevalent miſtake concerning it, which requires to be obviated.—In the quarters where it is beſt known, the carpenters eſteem it highly, but generally call it, the ENGLISH ELM; while, in the nurſeries, a very different article goes by that name; and hence, where the former is intended, the latter is commonly procured at a much ſuperior price; and no wonder, as they are either raiſed from layers, (a very tedious proceſs,) or are grafted on the Witch Elm;

which method is certainly preferable, as far as regards the purchaſer; for ſuch not only grow abundantly faſter than the others, in equal ſoils, but never throw out ſuckers; as the Witch Elm produces none.

The objection already ſtated, to planting this tree in mixed plantations, deſerves attention, as there are few ſituations where it would not overtop, and conſequently damage many other ſorts; of courſe, as a principal, it had beſt be planted alone. Yet ſuch plantations would be much improved, by introducing a quantity of Spruce and Scotch Firs, with the Birch, by way of nurſes; as all the four ſorts would do well together on a ſtiff and ſomewhat thin ſoil, where many others would not.—The ſhelter would very much correct the propenſity of the Elms to produce ſtraggling branches, as well as promote their towering; beſides

taking off the appearance of naked ſtems, and a ſquare heavy ſurface; while the pruning neceſſary would be very trifling indeed.

In recommending this plant for an indifferent ſoil, it is not to be inferred that it is improper for almoſt every deſcription of good ones; as perhaps few trees would ſo well deſerve ſuch ſituations, in the vicinity of places where it may be wanted for the purpoſes of the boat builder, cartwright, &c.

The Huntingdon or Swallow-Tail Willow.—This plant, though well known as a pollard, has been very little cultivated as a timber tree; and hence furniſhes a ſtriking inſtance of the ſupineneſs of mankind, in regard to the properties of many ſorts of wood. Every one knows the willows are quick growers; and yet it is conſidered as a ſort of hereſy to ſuſpect that the wood

of any of them can be at all durable.— There is beſide an objection to this willow, inaſmuch as it uſually divides itſelf into a number of large arms, before it acquires any tolerable length of ſtem :—this defect, however, is to be imputed entirely to ignorance or inattention; as few trees require ſo little management to be made grow with a long, clean, and ſtraight trunk.

As a pollard, this willow is, in many places, found conſiderably profitable; ſtill I do not recollect to have ſeen a rood of it growing as timber any where, though no doubt can be entertained of its obtaining purchaſers; as, with extenſive uſefulneſs, it is alſo conſiderably durable; a property which it appears may be much augmented, by ſteeping ſome months in water, as is frequently done with oak ſaplings; an excellent practice, and worthy of imitation every where.

If the queſtion were aſked, in which way I thought a quantity of good, deep, and ſomewhat moiſt land, in a ſituation not expoſed, nor poſſeſſing any local advantages, could be turned to the greateſt profit? I ſhould ſay,—by planting it with ſome or all of the following articles, namely, the Huntingdon Willow, the Abele, and the Black Italian Poplar; as all of them ſucceed beſt in that ſort of Soil, are remarkably quick growers, and would (except in the firſt inſtance,) require only the ſame ſort of management.

The advantage of a deep ſoil over ſuch as are ſhallow, ſo far as regards the production of timber, are conſiderable, and well worth the planter's attention; though it may fairly be queſtioned, if more than a foot in depth eſſentially benefits the general purpoſes of agriculture:—For, firſt, trees generally penetrate into or make uſe of *the whole depth;* and, therefore, though

the ſoil neareſt the ſurface is commonly found moſt fertile in timber produce, and it is admitted that the ſame ſort of fertility which influences the growth of grain and graſs materially affects the growth of trees, —yet it is obvious the latter will thrive in ſoils where the former would not;—and, therefore, the quantity or depth of ſoils is always an important conſideration; and more eſpecially ſo where proper ſpecies of trees are ſelected to ſuit them; as it is difficult to deſcribe any that are ſo completely ſteril as to be incapable of producing one or more ſorts of uſeful timber.

Another conſideration is,—on deep ſoils the trees cannot fail to vegetate ſomewhat regularly, through the whole of their proper growing ſeaſon; being but little affected by the droughts, which often very materially retard the growth of ſuch as are planted on thin ones.—The reaſons are obvious:—Roots that are near the ſur-

face, in a parched ſoil, cannot extend themſelves in ſearch of the neceſſary food of the plant, otherwiſe than very ſlowly; and hence its increaſe is retarded in proportion.—But how different is the caſe of ſuch as have part of their roots lower than any conſiderable degree of drought can penetrate; as, at ſuch ſeaſons, the lower ſoil, being acted upon by the warmth and drought ſo detrimental in the other caſe, are *beſt* qualified to aſſiſt in the buſineſs of vegetation; and, therefore, the roots in *them* not only materially contribute to ſupport the head of the plant, but to enable the others to perform their proper functions. A healthy tree has a general circulation through every part of it; ſo that if one has what may be called neceſſaries, the others are never found in want. Beſides all which, the ſurface of deep ſoils cannot be affected by ordinary droughts, to any conſiderable depth;—as the heat and drought acting upon them

occaſion their imbibing a conſiderable quantity of moiſture from below. In ſhort, it is among the advantages attached to planting trees, that, in numerous inſtances, they convert the USELESS into USEFUL: They are, in fact, a ſort of miners, who can find gold, where every other deſcription of miners would ſeek for it in vain.

Two circumſtances jointly hold out peculiar inducements to plant theſe trees in ſuch places, as they not only ſoon grow ſtrong enough to be in no danger of damage from cattle; but they grow ſo exceedingly tall, that the land may ſoon be returned into paſturage, and become no leſs productive in graſs than before, while there is an aſtoniſhing annual increaſe in the produce of timber.—Moſt people muſt have obſerved, how freely the graſs grows under the willow pollards, which have *ſhort ſtems* and ſpreading heads, though not more than ten or twelve feet aſunder; and,

therefore, no doubt need be entertained in regard to the herbage, if the trees had ſtems of four or five times that length, and ſtood fifteen or eighteen feet from each other.—Indeed, taking into account the manure, (or, at leaſt, the rich vegetable matter, furniſhed by the decompoſition of fallen leaves,) it ſeems highly probable that land, ſo cropped, would produce more paſturage than another part of the ſame field, employed for that purpoſe only.

Here two methods, of preparing the ſoil for ſuch a purpoſe, preſent themſelves: The firſt is trenching the ground about eighteen inches, or, what is called, two ſpits deep; laying the ſward reverſed in the bottom of the trenches.—This method would certainly very much accelerate the growth of the trees, but then the expence of it would be from ſeven to nine pounds per acre; and that is not the only objec-

tion; for, as the ground would be turned up lower than the common fertile depth, it would be found only in few cafes in a condition to bring a crop of grain the firft year, with the plants; a matter well calculated to reduce the expence of planting, &c.

For this reafon, I fhould recommend that land, previoufly in grafs and intended for fuch purpofes, fhould be fown with oats the year preceding; and, in order to the fwards being as much rotted as poffible, the ploughing for that crop fhould be done early in winter. In the autumn following, on the ground being cleared and fufficiently moift, it fhould be ploughed at leaft twice; as deep as the plough could poffibly reach, and harrowed after each operation; fo that it would be fufficiently broken to receive the plants, with a crop of oats,(z) the following fpring. The latter, however, fhould, in the firft place,

must necessarily immediately precede the planting.— The crop, when ripe, must be carefully reaped, not mown.— Ja. 70.

be ſown and harrowed in; after which, the planting ſhould immediately follow; as, in that caſe, it might be done on ſoils ſo prepared, without materially injuring the grain[a]; for, with reſpect to the willows, a niche, made with the ſpade, would be ſufficient to let in the ſet;—and, as to the Abeles and Poplars, they ſhould be of only one year's growth[b]; and, therefore, might be planted, without moving much of the ſoil.

The beſt willow ſets, for ſuch purpoſes, are made from ſhoots of two years' growth, of not leſs than about three quarters, nor more than one and a half inch diameter. The length may be from ten to twelve inches; of which, not more than two are to be left out of the ground.—Theſe ſets ſhould have their tops a little ſloping, but the bottoms are better cut ſomewhat ſquare.——The diſtance between each plant ſhould be four feet.[c]

[b] The Poplar sets should come from one year in the nursery: when about one half of them will be, fit to plant out. The other half

The only further attention neceſſary, during the ſummer, would be to go over the willows, as ſoon as they had formed ſhoots from three to ſix inches long, and to ſlip off all, except the ſtrongeſt, from each ſet; after which, neither they nor the poplars would require further dreſſing, till both had grown two ſummers, from being planted; and then they would properly come under the general ſyſtem recommended for the management of of plantations in *The Foreſt Pruner.*

The fence for ſuch a purpoſe, being only a temporary matter, might be cheaply made by ſinking a ditch about half a yard, and raiſing a bank, about fifteen inches more. A hedge, or bearding, on the top of it, about a foot high, and placed rather projecting outwards, would complete the buſineſs. This ſhould ſtand

the growth of the B. Italian Poplar, they need not be planted closer than 6 feet from each other. — See p. 163. —

fix or eight years, and be then diſplaced, ſo as to leave the field level as before*.

* Fully aware that the ſucceſs of planting ſpeculations muſt be influenced by many varying circumſtances, I ſeldom venture upon calculations; ſtill, by reaſoning from the rapid growth of the ſorts of trees under notice, upon every ſoil that is proper, we find a ſort of criterion by which to form an average eſtimate of what may be the profit of them; before and after the firſt ſeven years from planting.—It would ſeem a moderate eſtimate to ſuppoſe that two crops of grain, from good land, previouſly old ſward, would defray the rent and taxes for the two firſt years, and, alſo, the expence of planting and fencing; but were it to prove a few Pounds ſhort that would not materially affect the ultimate reſult. Suppoſe then the rent and taxes to be Three Pounds Ten Shillings annually, that, with compound intereſt, would in ſeven years amount to about Twenty-eight Pounds Ten Shillings.—To this we oppoſe the ſuppoſition that the plantation increaſes in value, Five Pounds the firſt year; and to increaſe more by Thirty Shillings the next, and ſo on for ſix years; at the end of ſeven the acre would be worth Sixty-ſeven Pounds Ten Shillings, a profit of about Thirty-nine Pounds.

The Upland or bad twigged Willow.— Why this tree has obtained the appellation of Upland is by no means clear, but probably it has been ſuppoſed to grow better than the other Willows in ſuch ſituations; which ſeems not to be the fact, as the Huntingdon Willow grows very rapidly on

Obſerve, it is not ſaid the trees would then be worth ſo much to ſell, as that is by no means the proper mode of valuing a thriving plantation; the right method is to have a regard to what may be their probable future increaſed value; and by that means to eſtimate their preſent one; as, for inſtance, a quick growing tree, now only worth Six-pence to ſell, may eaſily be worth Eighteen-pence in four years more; and hence there could be no impropriety in valuing it now at Ninepence, or one third more than its preſent ſaleable worth.

About the age of ſeven years the thinning ſhould commence; and, therefore, an annual produce might be had from that time forward; but as no data exiſts, by which to eſtimate its value, the ſafer method is to calculate upon an increaſing annual produce for at leaſt ten years longer; during all which time, as well as afterwards, no doubt need be entertained of an annual

a dry ſoil, of moderate depth.—However as neither of them flouriſh ſo abundantly, there, as on moiſt ones, they are never likely to be cultivated extenſively, except upon the latter. Probably, in different parts of the country, the two ſpecies may be known by names very different from the above, but ſtill it is evident they are every where eſteemed in preference to the others, as we very rarely find a Willow Pollard of any other ſort.—In ſummer they may ea-

produce of Twenty Pounds per acre, beſides the value of the herbage, from the time of the fence being diſplaced.

Evelyn, ſpeaking of the Abele, ſays " the Dutch " look upon a plantation of theſe trees as an ample " portion for a daughter, and none of the leaſt effects " of their good huſbandry."—We know that this excellent hint was addreſſed more than one hundred and forty years ago to thouſands who had the means of benefiting by it, and yet, how lamentable!—we are yet to learn where is the ſingle acre that was planted in conſequence!!!

ſily be diſtinguiſhed at a very conſiderable diſtance, as the Huntingdon appears of a light green, while thoſe of the other, though darker in fact, appear of a hoary or ſilver-like hue; in conſequence of being covered with a ſort of down.—In winter we diſtinguiſh them by the ſhoots of the former being brown, and ſomewhat brittle, eſpecially thoſe from two to four years' growth; while thoſe of the other are of a dark red, and very tough. Their manner of growth and ſhape of the leaves are much the ſame; nor does there appear any material difference in the timber or quality of their wood;—ſtill, in almoſt every inſtance, the Huntingdon appears to be the quickeſt grower; and, therefore, where it can be procured, moſt worthy of attention*.—The plate of the

* It would have been particularly gratifying to have been able to produce ſome deciſive proof of the durability of theſe ſorts of Willows; but as I can ſtate nothing poſitive from my own knowledge, it muſt ſuffice to

*K

Willow in Hunter's Evelyn's Silva, gives a very correct idea of this ſpecies.

Undoubtedly theſe Willows are both calculated for extenſive uſefulneſs, as Timber, but unfortunately, for want of a good method of training them as trees, in the firſt inſtance, and, in conſequence of very limited and vague ideas of their properties, they remain, as from time immemorial, claſſed among the woods of loweſt value.

The Black Italian Poplar.—As this ſpecies is not mentioned in either Evelyn or Millar, it ſeems to have been introduced into the country ſince the latter work. An opinion which, I think, is confirmed by the circumſtance, that no old trees of

remark that every thing I have gathered from either the obſervations of myſelf or others, goes to eſtabliſh the fact; while not one circumſtance has appeared (prejudice excepted) to diſcredit it.

it are to be found any where; and, though it is now common in the northern part of England, we very rarely find it in the ſouth; while the Lombardy rears its ungraceful form every where.

Unfortunately, moſt perſons take their ideas of the Poplar tribe from the *appearance* of this plant only;—an impreſſion ſo far unfavourable, that, with many, the whole ſpecies are in diſgrace.—But though expectations (which were much too ſanguine,) have been, in a meaſure, diſappointed, in regard to the Lombardy Poplar, it by no means follows that ſuch will be the caſe with the Black Italian:—indeed, matter of fact proves, that, as the one ſinks, the other riſes in the ſcale of eſtimation, ſo far as they are known:—and hence, with myſelf, it is matter of doubt, whether the very extraordinary encomiums which uſed to be laviſhed on the former, at its introduction, were not, in

Black Italian Poplar.

fact, founded upon the merits of the latter.

It is quite as likely that the Poplars of Italy, in general, ſhould have been obſerved, as thoſe of Lombardy in particular; and it is far from clear that both are not grown in every part of the country; and, therefore, a very trifling miſtake might lead to the conſequence now alluded to.——We know that the merits of the one are abundantly ſuperior to that of the other; but why the latter ſhould have been introduced by ſo many encomiums, and the other none, is difficult to conceive, except by ſuppoſing, that, ſomehow or other, they have exchanged both names and reputations.

The Black Italian is very different from the Lombardy in form, as it almoſt uniformly riſes with a light but regular conic head; being ſo hardy as generally to pre-

ſerve the ſame leader, from the ground to an immenſe height; in conſequence, its ſtem is remarkably ſtraight; and hence, in plantations, very trifling attention will form it *clean*, to any reaſonably required height.

This tree is an aſtoniſhingly quick grower, on every ſort of ſoil that may be called tolerable, though it certainly luxuriates moſt of all in deep fertile ones; while its timber is applicable to purpoſes ſufficiently numerous; among which is that of making very good floors; and, therefore, no doubt need be entertained of its always commanding purchaſers.

In that ſort of planting which perhaps may be conſidered as moſt of all profitable, namely, that which adds to the comfort and conſequence, and, of courſe, the value of a place, previouſly ſcantily furniſhed with that important appendage—WOOD,

(a) Mr. Pontey recommends it to be planted in the best of the cultivated land at Slaughaam.

this tree is excellent; as, in judicious hands, it may be made to produce very conſiderable effects, while many others (highly eſteemed) would produce them in proſpect only.——In ſhort, for diſtant ſcenery, where WOOD, not ſpecies, is the *immediate object*, this plant, hitherto in many places a ſtranger, is clearly ſuperior to all the family of the foreſt*.

* As the Lombardy Poplar is well known from its peculiar erect manner of growth, it affords the eaſy means of deſcribing the Black Italian by *compariſon*.—The leaves of both are very much alike in colour, ſhape, and turn, the only difference being in the latter producing them ſomewhat larger than the former, though not near ſo large as the other Poplars, whoſe leaves are at all ſimilar. The branches of the latter grow much leſs erect, and, likewiſe, much thinner upon the ſtem.—The only other diſtinction neceſſary is the bark, which on a ſtem or branch, of from two to four or five years' growth, is always found ſmoother, and of a much darker colour than any of the poplars that are at all like it in other reſpects.

The Abele or Hoary Leaved Poplar.— In bringing this article under notice I cannot help remarking on the utility of an author introducing ſamples, in preference to mere deſcriptions of valuable woods, hitherto but little known and leſs underſtood, as is the caſe with the preſent ſubject; certainly it was ſomething like this that firſt convinced me of its extraordinary worth; as, though in common with other people, I have been in the habit of reading deſcriptions of the Abele, it was not till a late viſit to my honoured patron Lord Sheffield, at Sheffield-Place, Suſſex, that I had any clear ideas of its being any other than a *white*, and, alſo, a *light*

As, in my profeſſional excurſions, ſouthwards, I have been generally diſappointed of meeting with the article at the nurſeries, and have frequently had other ſorts ſubſtituted in its place, there can be no impropriety in ſaying here, that, whoever finds a difficulty in procuring it, may be furniſhed with the true ſort, of any uſeful ſize, by addreſſing a line to the author.

Vide wood, of extremely quick growth, and rather inferior than ſuperior to the general ſample of poplars.

That Nobleman, who upon every proper occaſion manifeſts a decided partiality for national produce, has lately made ſome Floors of this Wood, which, in appearance, are ſuperior to any floor I have ſeen, whether of Deal or Oak; and, as to durability, I ſee no reaſon to doubt of that, if the denſity and weight of the article be conſidered, in connection with ſuch teſtimonies as books afford relative to the point.— Floors, however, are only *one* of the many *inferior* purpoſes for which it is applicable; as it is certainly proper for almoſt every article of furniture uſually made of mahogany. For the lighter deſcriptions of it, now ſo faſhionable, it may be made a very good ſubſtitute, without any other addition to the natural colour of its heart than the means

cabinet makers generally reſort to, in order to heighten the colour of ſuch wood; and with reſpect to the ſap, and where more of colour is required, the aqua-fortis ſtain will inſtantaneouſly produce it, ſo far as that it would be difficult to diſtinguiſh it from real Mahogany.—Indeed, it is equal to the beſt, in colour and ſmoothneſs of ſurface; and much ſuperior to the plain or inferior ſorts in thoſe reſpects, as well as tranſparency and variety; and it has the further advantage over Mahogany, and moſt other woods, that it takes but little of either oil or rubbing, to produce upon it the ſort of mellow ſhining ſurface, ſo much admired in furniture that has been ſome years ſubjected to proper attention*.

* It is evident, that notwithſtanding all which has been ſaid by authors, (and certainly they have been by no means ſparing of their encomiums on the timber of the Abele,) ſomething more is neceſſary to induce men to either plant it liberally, or take proper care of what they have growing.—If the improved ſamples,

Planting on Steeps.— As theſe are ſituations confeſſedly unpropitious to the cultivators of the ſoil, they naturally fall under the cognizance of planters.—But, though moſt of theſe can eaſily ſee the propriety of *planting* them, few are ap-

produced with this treatiſe, added to the circumſtance of the plainer ſorts of mahogany being now worth Sixteen Shillings the ſolid foot, produce no beneficial effects, I ſhall ſay that prejudice has indeed uſurped the place of common ſenſe.

Lord Sheffield, who kindly furniſhed me with the wood for ſamples, has ſeveral extremely large and tall trees of this ſpecies, moſt of which have been planted rather for ornament than uſe, being in the avenues.—They are ſomewhat brittle, and, therefore, liable to be broken by the winds on expoſures; ſome of his Lordſhip's have ſuffered in this way; after which they very much reſemble the trees ſo much admired in the pictures of Salvator Roſa; who moſt probably took a hint from their pictureſque appearance.——Nor has Homer done them leſs honour, as the following deſcription evidently alludes to this ſpecies only, the appearance of all the other ſorts being very different:

prized how peculiarly they are adapted to the purpoſe; or that there are five reſpects in which they are clearly ſuperior to levels.

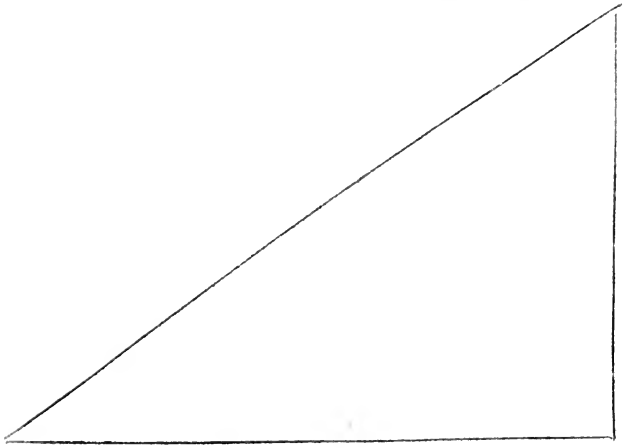
So falls a Poplar, that, in watery ground,
Rais'd high its head, *with ſtately branches crown'd,*
(Fell'd by ſome artiſt with his ſhining ſteel,
To ſhape the circle of the bending wheel,)
Cut down it lies, *tall, ſmooth, and largely ſpread,*
With all its beauteous honours on its head.

POPE.

From this we gather, that the wood was then in uſe for making wheels, (perhaps, water wheels; and, if ſo, it furniſhes a proof of its durability in moiſture:—but if not, it ſhows the high opinion then entertained, of the ſtrength and toughneſs of its timber.)

There is a variety of this poplar, which the planter, who wiſhes for quick growth, will do well to keep clear of.—Its leaves are rather leſs, with a ſurface ſomewhat more ſhining, and of a darker green.—The underſide of the leaves is whiter as the down is finer, and lies much cloſer than that on the others.——This does not grow near ſo quick as the other, and uſually goes by the name of the Shining Leaved Poplar.

Firſt.—They admit of a greater quantity of trees being planted upon an acre, or otherwiſe they allow to every one an increaſed quantity of ſurface.—To demonſtrate this fact, which has been long and frequently the ſubject of diſpute, we have only to obſerve, that, in meaſuring a ſteep, the dimenſions of its *baſe*, and not the *ſurface*, is or ought to be taken: of courſe, on ſteeps ſimilar to the annexed figure, the baſe and the ſurface differ



as five to four; and, therefore, in foils of equal depth, a faving of one in five is clearly gained, by planting upon fuch a fleep. Where the afcent is lefs, the faving will be lefs in proportion.

Planting on fleeps.

Secondly.---Trees planted on fteeps have likewife an increafed quantity of air. To prove this, we have to conſider that as, upon the average, each tree muſt rife above its fellow, equal to the proportion of the afcent, ſo each will have ſo much the greater quantity of ſurface expoſed to the influence of the atmoſphere:—where a moderate portion of *that* is wanting, we may have trees tall, but they will be proportionably weak; where too much is admitted, they will be ſtiff, but ſhort; a fteep ſerves, in ſome degree, to moderate the two extremes; and, therefore, as well as on account of the increafed ſurface, it is evident, that more timber may be reared upon them than upon levels.

Planting on Steeps.

If the face of a ſteep be concave or convex, or partially ſo, the trees will be more ſheltered than if it preſent a more even ſurface; as, in either caſe, the current of the wind, inſtead of ſweeping in a ſtraight direction among the ſtems, or upon the ſummit, will be broken in particular places; and hence much of its force will be loſt.

Thirdly.—On ſteeps, trees are more ſheltered than on levels of equal elevation.—In conſidering this matter, two points of the compaſs are out of the queſtion; as when the wind blows *along* the ſteep, its effects muſt be much the ſame as from blowing along levels. When it blows from behind, or down ſuch ſteep, there will be a calm among the trees, except ſuch as are near the ſummit. But, to counterbalance this advantage, it may be ſuppoſed, that, when the wind blows *up* the ſteep, its force will be conſider-

ably augmented, by what is added in the aſcent; which certainly muſt be the caſe, ſo long as the ſurface is ſomewhat bare.—The matter, however, becomes materially different, ſo ſoon as the trees get a few feet high; as, from that time, the wind has to travel over a ſort of hollow ſurface, and, in doing ſo, great part of it ſinks in, and dies away among the branches.

Planting on Steeps

Fourthly.—It appears that, by planting on ſteeps, more of the adjoining lands will be ſheltered, than by planting the ſame quantity of ground on a plain.—Here, for the ſame reaſon as in the laſt caſe, two points of the compaſs muſt be left out of the queſtion.—As to the plain beneath, it will be completely ſheltered to a conſiderable diſtance, provided the planting extend to the ſummit of the hill; as the trees will have a tendency to throw the current of the wind conſiderably above the level of the plain at its feet.

The effects of the winds blowing up a ſteep have been mentioned:—on this head it is to be noted, that the effect on the grounds beyond the ſteep will be obſervable at diſtances, in proportion to the ſtrength of the blaſt; certainly the moſt violent will operate at the greateſt:—for as the wind, in driving up a ſteep, gets augmented by the level current, it, by that means, becomes ſo powerful as to drive the current, which otherwiſe would ſweep along the ſummit, to ſome height above it; when the ſtrength of both being reduced, by reſiſting each other, they deſcend to the ground together, at a diſtance from the top of the hill; greater or leſs in proportion to the level of the ſurface;—where the ground falls, the ſhelter operates to an extent almoſt beyond credibility.

On levels, the current of wind ſweeps immediately along the heads of the trees,

from one end of the plantation to the other; while very little of its force is loſt by ſinking in among the branches*.—Certainly ſuch ſituations preſent nothing con-

Planting on Slopes.

* At Stanmer, near Brighton, the ſeat of Earl Chicheſter, ſeveral of the tops of the hills, which are directly oppoſed to the ſea breeze, have been planted: in theſe caſes, many of the verges of the plantations exhibit a cloſe front, quite from the ground; ſomething ſimilar to that of a clipped hedge, but, ſloping much the ſame as the ground below them. The height of the front ranks of the trees differing, in proportion, as they approach to or recede from the brinks of the ſteeps while almoſt every branch and twig bends from the blaſt.—This circumſtance, added to that of the trees having been planted very thick, and each producing a flat head, ſerves to conduct the whole current of the wind to every part of the plantations within its reach; in conſequence, no tree can tower *there*, (the Scotch fir excepted,) otherwiſe than as they riſe *en maſſe*.—To remedy the evil in ſome degree I have adviſed, to thin ſuch fronts conſiderably; as, by that means, much of the current will ſink in, and be lulled among the front trees; which, in themſelves, can only be valuable as ſhelters to the others.

ſiderable, either to break, elevate, or diſſipate it; and, therefore, it muſt fall to the ground, not only much nearer, but with much greater force than in the other caſe; and hence the effect of the ſhelter will be proportionably leſs.

In many ſituations, advantages may be gained, by planting the higher parts of ſteeps with the talleſt and quickeſt growers; as ſuch means produce a ſort of concave ſummit, which abſorbs more of the wind than an inclined plane; and likewiſe throws the remainder higher; of courſe, its deſcent would be at a greater diſtance, and the ſhelter increaſed accordingly.

Fifthly.—As whatever is ornamental adds not only to the *ideal* but the *marketable*, and, of courſe, the *real* value of an eſtate, we may obſerve, that planting on ſteeps has an extraordinary claim to

attention, as producing one of the nobleſt ſpecies of ſcenery, at an expence which, compared with that of moſt other improvements, muſt be conſidered as trifling in the extreme.—I need not dwell on a feature which may be called equally bold and beautiful, A HANGING WOOD; as that is univerſally acknowledged;—but may juſt touch on ſome matters not ſo generally known:—for inſtance, contraſted with planting on a plane, that on a ſteep gives the idea of abundantly more in quantity; as, on a plane, moſt of the ground ſeems to be loſt, except from ſome particular point where a bird's eye view can be had of the trees.—The whole ſurface of a ſteep, on the contrary, may generally be ſeen from many points; and, when covered with wood, always appears larger than its real dimenſions.

It ſhould be obſerved here, that, to give the greateſt poſſible idea of ſize,

the higher termination of ſuch planting ſhould, by extending beyond the ſummit, be hid from the principal points of view, and more eſpicially ſo when it ſerves to bound a lawn or park ground. When ſuch is the caſe, and the plantation is of conſiderable length, it ſhould have one or more large breaks through it; as theſe, with the concealed termination of the planting, would give the idea of *continuation* to ſuch ground, and the woods would appear to be large and *within* them, inſtead of proclaiming, as it were, their *termination*, and exhibiting, at the ſame time, a ſtripe of planting perfectly inconſiderable*.

* The delightful reſidence of Blythe, near Bawtry, will ſoon preſent a ſtriking practical inſtance, of the effects which may be produced by the ſort of planting juſt mentioned. The park grounds, in front of the manſion, are chiefly flat; but, to the left, are terminated by riſing grounds, *planted*:—the two ends with Oak the centre with Firs:—the whole ſhowing clearly that *the Park ends there.*—At the ſame time, the

When the ſurface of a ſteep to be planted happens to be ſomewhat regular, or an inclined plane, and the higher part of ſuch planting will be ſeen from below, the object *then* is to *improve* and not *conceal* it; as in the latter caſe.—For

heavy appearance of the firs point out from the houſe, their own termination, as well as that of the oaks, which otherwiſe would not be diſcovered, as they extend ſomewhat beyond the ſummit of the hill.—It happens, that the winds have torn up many of the firs, and the reſt are by no means in a thriving ſtate; I have, therefore, ſuggeſted the propriety of taking them down, and converting that ſpace into graſs; which will preſent the idea of the park ground being continued between two conſiderable oak woods; as the view will only be terminated either by the horizon, or trees, at not leſs than three miles diſtance. I may obſerve too, that at preſent, there is no approach to the place from which it can be ſeen otherwiſe than partially, and to great diſadvantage; a defect which the propoſed means will completely remove; as from a road, ſituated juſt beyond the higheſt point of the intended break all the fine features of the place will, *inſtantaneouſly* burſt upon the traveller!!

this purpoſe, ſome of the talleſt and quickeſt growing trees may be introduced into the higheſt ſide of it, as mentioned under the laſt head;—as ſuch means would, at once, increaſe the apparent ſize of the planting, and the height of the hill; and, and at the ſame time, preſent a ſort of concave ſurface, which would be conſidered as abundantly more bold and beautiful, than one either convex or an inclined plane.

Adopting of Species, beſt of all ſuited to the ſoils, is a matter well worthy of the planter's moſt deliberate conſideration: certainly they who neglect it, have no well founded claim to the appellation of Profitable Planters.—Nothing can be more abſurd than the planting of extenſive tracts with many ſorts, confeſſedly with an eye to profit, without due regard to *ſelection;* for though, in moſt ſoils, any of the common ſorts of foreſt trees will grow,

yet, in almoſt every inſtance, ſome one or more will be found luxuriating abundantly more than the others; and, hence, it is the planter's buſineſs to uſe his utmoſt ſagacity to aſcertain the ſpecies, either before he begins, or, at leaſt, before he has made much progreſs in the buſineſs.

In doing this, I would ſeriouſly caution him againſt truſting to Theory, provided more ſatisfactory means prove within his reach; a circumſtance very ſeldom wanting.—The method I have generally adopted, when conſulted upon ſuch ſubjects, is to make an excurſion among the trees in the neighbourhood, and to examine the ſoil where any ſort or ſorts are found moſt thriving, in order to determine how far it correſponds with that intended to be planted.—In fact, I never give a decided opinion till *repeated obſervations* have ſatisfied myſelf as to the moſt proper *ſpecies*.

It will readily be ſuppoſed, that, in doing ſo, an old planter cannot eaſily diveſt himſelf of what he has previouſly learned; and hence ſhould it prove, that the ſpecies, *ſuppoſed* to be moſt proper, was not found growing in the neighbourhood, inquiry ſhould be made for the neareſt place where it might be met with on a ſimilar ſoil, or as nearly ſo as circumſtances would admit; by which means, it could rarely happen but the ſelection would prove very good, if not the beſt which the ſoil admitted of.

Perhaps the neceſſity for ſuch obſervations will be evident, upon conſidering, that every ſoil, exhibiting the ſame ſort of appearance, does not poſſeſs exactly the ſame ſort of properties.—For inſtance, on ſtiff ſoils, the Larch has, of late years, failed very much; which, however, does not prove that ſome of them are not well calculated for the article; as, at Woburn, they

grow as well upon ſoils moderately ſtiff, as upon the ſand; which circumſtance, I preſume, may be imputed to the former being conſiderably calcareous, or what may be called a ſpecies of Marl.—On chalk lands, we obſerve the ſoils on the ſurfaces to differ materially; ſome are very ſtiff, and others very light, and yet the Larch is found to grow freely on both deſcriptions; which may probably be imputed to the cauſe juſt noticed, namely, the calcareous matter found in them.

Again, the Oak is generally obſerved to flouriſh moſt on a loamy or ſomewhat ſtiff ſoil, often where it is very much ſo; but yet I do not recollect to have ſeen it flouriſh abundantly on ſtiff calcareous ſoils any where; though it will be readily admitted, that on ſome of them it grows much better than on others.

The foil about Sheffield-place, before mentioned, produces timber in general, quicker than any other which has fallen under my particular obſervation; and, what is moſt remarkable, the Oak and the Larch flouriſh *equally* upon it; though it would ſeem too light for the former, and too ſtiff for the latter*.

* In order to aſcertain the conſtituent parts of this ſoil, ſo remarkable for the production of timber, Profeſſor Davy ſubmitted one hundred parts of the entire ſoil to analyſis, which produced the following refult:

Water	3
Silex	54
Alumine	28
Carbonate of Lime	3
Oxide of Iron	5
Decompoſing Vegetable Matter	4
Loſs	3
	100

Again:—It appears, that the growth of ſeveral ſorts of trees is materially affec-

ted by the degree of mineral taint found in the ſoil;—a circumſtance which never directly meets the eye.—Above Mines, and in their neighbourhood, we ſeldom find the timber growing freely. The Larch ſeems particularly averſe to ſuch ſituations, while the Oak and Witch Elm appear leſs affected by them than timber trees in general. In ſhort, it may be ſafely aſſerted, that, though experience will generally enable us to form a pretty accurate judgment of the ſpecies moſt proper for any given ſoil, yet obſervation added to it, will furniſh a much ſafer guide; and, therefore, no one is excuſable in neglecting it.

When the planter has fully availed himſelf of the foregoing general obſervations, he may probably find an advantage in attending to the following deſcriptions of the ſoils, upon which the more uſeful ſpecies of Foreſt Trees will grow and thrive.

First, *The Oak.*—This generally ſeems to grow quickeſt on a deep and ſomewhat ſtiff ſoil, but yet any perſon of obſervation muſt have ſeen that it grows well on every ſpecies that can be called good. On ſand and very ſtiff clays it will grow too, but very ſlowly; and, therefore, an attempt to raiſe it on ſuch cannot be conſidered as *profitable planting*

The Aſh,—Grows moſt freely on a deep loamy ſoil, more particularly if it be in a conſiderable degree calcareous.—It likewiſe grows well on the more tenacious ſorts of Bog Earth, after they have been drained. *Generally*, we may remark, that its quickneſs of growth depends upon a tolerable quantity of moiſture, and not a ſmall one of what may be called natural fertility, of which it is a prodigious conſumer.—However the tougheſt, and, of courſe, the beſt Aſh, in quality, is uſually found to be

produced on a ſoil *light*, but neither very *moiſt* nor *fertile*.

The Elm.—Under another head (ſee p. 65,) the properties of the Broad Leaved Witch or Scotch Elm have been noticed. The Narrow Leaved, or what is uſually called, in the Nurſeries, The Engliſh Elm*, is rarely found in plenty, except where the ſoil is *dry*, *light*, and *moderately rich*.—It is true, we often find it thriving tolerably, in plantations, avenues, &c. where the ſoil is *ſtiff*, *moiſt*, *and poor*; but, in ſuch caſes, it will generally be found, upon examination, that it has been grafted, as is uſual, upon the Witch Elm; and hence on theſe, as on every other ſoil, its growth is conſiderably accelerated.

* It is probably called *Engliſh Elm*, from the circumſtances of its abounding in the hedges, in many parts of the country; but, ſince I have never known it to produce ſeed, and know that in ſuch places it propagates itſelf by ſuckers, I think it improperly ſo called.

Among both men and books, it remains matter of diſpute, whether the timber of the *Engliſh* or *Witch* Elm is beſt. Undoubtedly each may be preferable for particular purpoſes; and certainly they muſt differ in quality, in ſome degree, from the circumſtances of age, ſoil, &c. Such a diſpute, however, ſeems proof ſufficient *that both are very good*; and therefore, choice, and the ſituations may determine the ſort to be planted, provided it be duly noted, that the latter grows moſt freely on every ſoil, and that the former grows but very ſlowly on indifferent ones; except it has been graſted upon the latter*.

* I have lately procured a new ſort, apparently a variety of the Witch Elm, which grows quite as erect as the Engliſh, and abundantly quicker than either that or the former. If the timber do not prove of inferior quality, it will be a valuable acquiſition, in both uſeful and ornamental planting; as, in a few years, it may be ſold at the ſame price as the graſted Engliſh Elms.

The Beech.—This tree may be ſaid to be peculiarly the inhabitant of dry ſoils, including ſand, gravel, and chalk; on all of which it grows very freely. On ſtiff ones too it will grow, but not near ſo well; and hence it deſerves no place on them, otherwiſe than for ſhelter, or to produce variety.

The Spaniſh Cheſnut.—This tree, like the laſt, is found to thrive beſt in a dry ſoil; and like it too, will make prodigious progreſs where it is far from rich.—On ſandy ones, where the oak would make but ſlow progreſs, I have ſeen this grow extremely quick; and, therefore, in ſuch caſes, the latter ſhould be ſubſtituted in the place of the former.—Its wood and bark are known to poſſeſs the ſame valuable properties as the Oak, in an eminent degree; while it is, in a meaſure, exempt from what may be called its principal defect, namely, the periſhable nature of its ſap or younger wood—Hop-poles and ſtakes of this wood

Suitable Soils. Chesnut.

are eſteemed every where, for their great durability, which, of courſe, have but little of heart in them. On wet or ſtiff ſoils, in the northern part of the iſland, the ſhoots of this plant ſeldom get ſufficiently ripened; and hence their extreme ends are often killed by the winter's froſts; and, therefore, attempts to raiſe it on them, for timber, uſually prove fruitleſs*.

* I have really been aſtoniſhed to obſerve the rapid progreſs of this plant on ſandy ſoils; more particularly at Berry Hill, near Mansfield. If the proprietors of lands in that quarter, who are anxious to raiſe oaks upon them, would, inſtead of planting thouſands of that article upon an acre at a great expence, content themſelves with planting two or three hundred ſmall Cheſnuts among Larch, Firs, &c. and take care to prune them, either annually, or every ſecond year, as they are apt to form double heads and large branches; and likewiſe take care the other trees did not over-top them, I am perſuaded they would, at a very trifling expence, provide a ſupply of the beſt ſpecies of timber, to ſucceed the firs, &c. Perhaps, on the ſandy ſoils in that quarter, more planting is done and doing than on five times the

The Sycamore.—Perhaps few trees will grow and even thrive (the Scotch Fir excepted,) on a greater variety of foils than the preſent ſubject; for it ſeems to reject none but Bogs, and the moſt barren heaths: ſtill it evidently luxuriates moſt of all on a deep and fertile loamy ſoil, where, of courſe, it is not ſtinted in regard to moiſture. I have obſerved a large tree of it growing freely on the ſide of a brook, where a conſtant ſtream waſhed more than half of its baſe; its other roots being in a dry ſoil. This proves it thrives in a conſiderable degree of wet; ſtill it may have too much; for I have ſeen fine thriving trees, of twenty years' growth, killed by the water ſoaking from a ſtream on a higher level, and keeping the ſoil, (naturally a dry one,) in which they grew, conſtantly wet.

ſame ſpace in any other part of South Britain. — Should the above hint be generally adopted, poſterity will have reaſon to ſay, It was well that ever the author *traverſed Sherwood's barren Sands.*

Poplars and Willows.—Having already introduced the Black Italian Poplar, with the above, and the two beſt ſpecies of Willows for Timber, and ſhown what are their moſt favourite ſoils, it needs only to be added here, that, though they are all regarded as aquatic plants, all of them which we conſider as valuable for timber, will thrive better in a very moderate than a great degree of moiſture; and they will alſo grow freely on a dry ſoil of tolerable depth;—nor do they refuſe either a ſtiff ſoil or a ſand, provided they are not very barren.—In truth, were we but half as well apprized of the various purpoſes to which their timber might be *properly* applied, as we are of the quickneſs of their growth, I am perſuaded they would then be conſidered as ſubjects worthy of general attention.

The Larch.—As the extraordinary value of this article gets, annually, better un-

derſtood, there is ſo much the greater need of clear ideas of the nature of the ſoil, upon which it will ultimately ſucceed; for as, hitherto, it has been planted indiſcriminately on moſt ſorts, and failed generally on ſome, and partially on others, there is ſome danger of its cultivation being diſcouraged.

Why this plant ſhould be attacked by inſects, on lands *deep, rich, and good*, where it had previouſly grown well, while it has continued to flouriſh in ſpite of being ſo attacked, on ſoils every way inferior, ſeems extremely difficult to account for; the fact, however, is obvious; and, therefore, without indulging in objectionable theories, we may certainly pronounce it an unſafe ſpeculation, to plant the article liberally on *ſtiff, humid*, or *deep rich ſoils*, except they ſhould likewiſe be conſiderably calcareous.

Perhaps no part of South Britain has suffered so much, from the ravages of the insect, as the South West part of Yorkshire; as there the best and richest lands have suffered very generally. On the moors, also, there are many instances of considerable damage. Of the latter, however, it must be observed, that the crust or surface, (a black mooriſh or heath soil,) which is certainly unfavourable to the article, differs as much in depth as from five to fifteen inches, and we frequently have both extremes in the distance of three or four yards. The second stratum is generally such as the plant will thrive in; and it is, likewise, in most places, of considerable depth; and hence it is that the trees, planted *in it*, usually grow well from the first; while such as are planted in the surface soil only, never make much progress, till their roots have penetrated through it; mean time, (of late years at least,) such

have been found almoſt uniformly infeſted with inſects.

It ſhould, alſo, be obſerved, that though ſuch under ſtratum is all of the ſame colour, (a reddiſh ſort of ſand,) and generally full of looſe ſtones, it differs materially in quality:—where the leaſt quantity of ſtones appears, the ſoil has the leaſt of grittineſs, and there the Larch ſucceeds the beſt;—where the ſtones are moſt plentiful, the ſoil proves proportionably ſharp, and there the plant thrives ſo much the worſe. Still, though the above may be conſidered as a general reſult, caſes have occurred where the plants have failed partially, where they had previouſly grown well, and where their roots were (apparently at leaſt) in the better ſort of ſoil only; a circumſtance which ſeems almoſt to puzzle conjecture. But ſtill, if two trees have grown nearly alike, and almoſt cloſe to each other, for ſeveral years,

Suitable soils. Larch.

and the one gets afterwards much infeſted with inſects, and the other very little, we may be ſure there is a cauſe for the difference, and that it muſt be with the roots. If the whole of one ſet continues to work their way through a deep and favourable ſoil, while a part of the others meets with obſtructions, from looſe ſtones, with but little of earth among them, or ſolid rock, as muſt often be the caſe in theſe moors, we ſhall then have accounted for the *cauſe,—a deficiency of earth and moiſture.* One tree muſt, in conſequence, be much weaker than the other; and it is well known, in regard to fruit trees, that ſuch are always moſt ſubject to be infeſted by inſects. Certainly nothing has yet appeared to ſhow, that a very large proportion of theſe extenſive heaths is not well calculated for the production of this very valuable tree, but paſt events have ſhown the neceſſity for juſt and careful diſcrimination.

It is, indeed, highly conſolatory to find, by collecting facts from many diſtant parts of the country, that though, on moſt of the ſandy and calcareous ſoils, the inſect has been very numerous, yet, hitherto, its effects have been but little prejudicial; and, therefore, we may reaſonably conclude, that they are peculiarly favourable to the plant; and hence, *on them, its cultivation may be moſt ſafely extended.*—Indeed, when we conſider of how little value many extenſive tracts of both deſcriptions are, for the general purpoſes of agriculture, and how much the reverſe for the production of this article, as well as many other ſpecies of timber, we can aſſign no reaſon why more of them are not planted, but that their value, in that reſpect, has hitherto been but imperfectly underſtood.

As to the inſect, there is reaſon to hope that we have ſeen the moſt deſtruc-

tive of its efforts; for, in the quarter that has been mentioned as the ſcene of its former triumphs, as well as every other which has come under my notice, its ravages ſeem to have been upon the decreaſe for the three laſt ſeaſons; and, during the preſent, it has done ſo little harm that, were it never again to become more numerous, it might be conſidered as no longer formidable.

The Scotch Fir.—The aſtoniſhing manner in which this plant accommodates itſelf to every deſcription of ſoil has been mentioned, (ſee p. 54;) in addition to which, it may be obſerved, that the only caſes in which it will not thrive is a bog, too wet for any plant, (aquatic excepted,) and a clay, too ſtiff for any part of the vegetable creation to thrive in. In the latter caſe, the reaſon of the failure is obvious; and, as to the former, it can only be imputed to the moiſture; as, in a *drained* bog, the

plant luxuriates prodigiously. It need not here be said, on what species of soil this tree will thrive best, as it is rarely planted with an eye to quick growth only; nor do I think the matter clearly ascertained; and, therefore, it may be enough to observe, that wherever any tree will grow freely, (the aquatics excepted,) the Scotch fir will do the same. Its peculiarly valueable properties, such as growing on heath soils, and on exposures where no other tree will thrive, have been particularly attended to, p. 54—62*.

* It has often been observed, in the nurseries, that this plant exhausts the soil less than any other; as, after a crop of it, the ground is always found in a condition to bear other articles. Whether this arises from the circumstance of smothering it only, or from the plant subsisting on less quantity, or a different species of nutriment, is not clear; but, perhaps, all of them may, in some degree, contribute to produce the effect spoken of.—We know, that it can subsist, and even thrive, on a nutriment which would starve most other trees; and we know too, that its roots being but little

Suitable Soils

The Spruce Fir.—The proper ſoil for, and the extraordinary value of this article, have been noticed at length, p 38—48, and, therefore, here it ſeems neceſſary only to preſs upon planters the advantages of uſing the plant liberally, in order to promote the towering of ſuch deciduous trees as are intended, ultimately, to form the bulk of plantations.

Here I may particularly remark, that both authors and planters are in the habit of erring egregiouſly, in regard to

fibrous, are hence ſo much the leſs calculated to exhauſt the ſoil. The aſh has already been noted as a prodigious exhauſter, but it only is ſo in proportion to the extraordinary quantity of its fibres. Perhaps it may be found, that plantations, mixed with Scotch Firs, uſually produce a greater weight of wood upon a given ſpace, than where it is excluded; and, if ſo, it can only be accounted for by ſuppoſing, that ſome or all of the cauſes above mentioned contribute to produce ſuch an effect.

the proportion of principals and nurſes; as they generally uſe as many, or more, of the former than the latter; though it is very eaſy to ſhow, that they ought to uſe three times as many of the latter as the former. For inſtance, when trees are planted at four feet apart, each occupies a ſurface of ſixteen feet; of courſe four of them will occupy ſixty four, or a ſquare of eight feet; and, therefore, if we plant three nurſes to one principal tree, all the former might be diſplaced, gradually, and the latter would ſtill ſtand only eight feet apart.

It has already been remarked, that nurſe plants ſhould, in every poſſible caſe, be ſuch as are moſt valuable at an early period of growth. It is repeated here becauſe the idea is of much the ſame importance to the Profitable Planter, that a good foundation is to a builder;—the point is indeed of the firſt importance; and, therefore, any *prudent* planter ſhould

Suitable soils.

Spruce Fir.

Birch.

have it engraved, as it were, upon his memory;—the conſequence of which would be, a liberal uſe of the Larch and Spruce Fir, for the above purpoſe, in every caſe where they would grow freely:—Still it is not intended they ſhould exclude all others, more particularly the Birch, which, with moſt of the properties of a good nurſe, ſuch as numerous branches and quick growth, on any tolerable ſoil or ſituation, is, likewiſe, highly ornamental. It is not, however, like the others, a wood of general application; and, therefore, much of its value depends upon local circumſtances; and hence, before planting much of it, it ſhould be conſidered for what purpoſes it would be wanted in that quarter; and, likewiſe, the probable quantity; as a very moderate one will overſtock the market, with an article of timber not uſeful for general purpoſes.

It muſt be acknowledged, that the errors of extenſive planters are neither few nor ſmall;—but yet I do not heſitate to aſſert, that all the reſt are trifles, in compariſon of the miſtakes in regard to proper ſpecies for this purpoſe.—If we caſt our eyes over the liſt of the more common ſorts of deciduous trees, we ſhall find that, with the exception of the Larch, the uſes of their poles, up to three or four inches diameter, are far from numerous; and hence it is eaſy to overſtock any neighbourhood with them, for they will ſeldom bear the expence of long carriage.

I could point out an eſtate, ſituated where firing is very ſcarce, that would produce more poles and faggots, the coming winter, than the proprietor can diſpoſe of for a dozen years to come; nor would lowering the price very materially increaſe the demand:—The conſequence of which is eaſy to foreſee; the plantations

will be very much damaged for want of timely thinning; mean time the proprietor's return, from them, but trifling. If the value of the larch and ſpruce fir had been known previous to planting, and alſo that the ſoil is much more proper for them than any other article *of nearly the ſame value*, they would naturally have obtained a preference, and the plantations would *now* have been highly productive, as the immediate neighbourhood would have taken off a large quantity of both, at a good price; but, unfortunately, *there* we find almoſt *none* of the former, and *but* few of the latter.—In ſhort, the eſtate exhibits ſome hundreds of acres of thriving plantations, upon which no expence (ſuppoſed to be needful) has been ſpared; and yet I ſee no reaſon to think, they are now of more than half the value they might have been made, at a much leſs expence, by attending to a proper ſelection.

I could point out many other extenſive plantations, which conſiſt almoſt excluſively of Scotch firs, though the ſoil is equally proper for the ſpruce and larch. In theſe caſes we uſually find the market overſtocked; and, hence, either the price of produce is kept low, or the thinning is neglected, but more commonly both.

Perhaps we ſhall be ſomewhat near the truth, in obſerving, that where Scotch firs are in tolerable plenty, a moderate ſized tree of it will fetch about half, and a pole one third as much, per foot, as the foreign fir timber; which diſparity could not happen, if there were not a doubt of durability in the one caſe, and a certainty of the want of it in the other; neither of which would *now* be the caſe, in regard to the larch; and as to the ſpruce, the ſpirit of inveſtigation now abroad inſures its worth being duly appreciated very ſoon.—The preſent high price of foreign wood leads

to two deſirable conſequences:—It not only ſtimulates to plant, but to look into the properties of native produce.—In ſome caſes, it creates a neceſſity for doing that which may ultimately prove highly uſeful, in the way of experiment.

Perhaps it is a new idea, that a much greater weight of wood may be produced, on any given quantity of land, by planting in mixture, than by uſing any one ſpecies only; and if ſo, ornament and utility may be ſaid to go hand in hand. The fact, however, is of a nature not to be either eaſily or ſuddenly demonſtrated by experiment; and, therefore, we muſt appeal to obſervation, in the firſt place. For myſelf, I have long been ſatisfied that ſuch was the caſe; having never yet ſeen a quantity of any one ſpecies growing together, which left the idea of an abundant produce upon my mind; though the

reverſe has often been produced, in the caſe of mixtures.

The agriculturiſt uniformly counts upon producing the greateſt *quantity*, by repeatedly changing the *ſpecies;* and the inſtances already produced are ſufficient to ſhow, that trees have what may be called a choice in their food, ſo far that they do not thrive equally on the ſame ſoil. We know, that ſome trees penetrate deep, while others have moſt of their roots at and near the ſurface; of courſe, by uſing both deſcriptions, the ſoil is more completely occupied. It may, likewiſe, be reaſonably ſuppoſed, that the decompoſition of a mixture of leaves produces a matter more favourable to the production of trees, than the produce of any one ſpecies applied to itſelf.—On the whole it appears, both reaſon and experience will fully warrant the concluſion, that the great-

eſt poſſible quantity of Timber is to be obtained by planting mixtures*.

Preparation of the Soil for Planting.

If we were to take our ideas of this ſubject from what might be found in books, we ſhould be led to think, that any thing ſhort of a very expenſive preparation would be the hight of folly; or rather, that it amounted to a ſpecies of inſanity; as it would be equally *a waſte* of Land,

* It has frequently been remarked, that deciduous trees thrive much better among firs than when planted alone, and the difference has been uſually imputed entirely to the ſhelter afforded by the latter: undoubtedly ſuch ſhelter is, in moſt ſituations, highly beneficial; but it ſhould be noted, at the ſame time, that all the reſinous tribe are different in nature, as well as appearance, from deciduous trees;—the former (it appears) cannot ſo far exhauſt the ſoil as to render it unfit for the production of the latter. If this idea be correct, it is evident that, in order to raiſe plantations of any ſort of deciduous trees, quickly, we ſhould plant much leſs in

Money, and Trees.—If, however, we look somewhat attentively into the matter, we ſhall find ſuch as are moſt loud in praiſe of preparation, are men who have learned little, or perhaps nothing from experience;—for true it is that, exactly in proportion as they have been taught in *that ſchool*, will be their means of diſtinguiſhing between what ſort of preparation is neceſſary, practicable, and politic, and the reverſe.

Preparation of Soil.

Moſt certainly the public have no reaſon to thank writers, who talk about preparation, without making the neceſſary

quantity of *it* than of firs. If five hundred and fifty of ſuch ſpecies were allowed to an acre, they would ſtand about nine feet apart, which is quite near enough to produce a tree of any tolerable ſize and figure.—We are ſure, that the ſame ſpecies conſumes exactly the ſame ſort of nutriment; and, therefore, every *extra plant* of it reduces what ought to ſupport ſuch as are intended to remain as *tenants of the ſpot*.

Separation of soils

diſtinctions; as it ſerves to throw difficulties in the way of what is in itſelf equally beneficial to ſociety and individuals; by repreſenting it as abundantly more tedious and expenſive than it is in fact.—However a little conſideration may ſhow any one, how little ſuch are acquainted with the buſineſs; for, were it otherwiſe, they muſt reaſon very differently;—from a knowledge, that at leaſt nine tenths of the lands, allotted to uſeful planting, are either too *ſteep*, *ſtony*, *buſhy*, or *heathy*, to admit of the ſort of preparation alluded to;—or otherwiſe too *ſandy* to need it.

Undoubtedly, ſands and heathy ſoils compriſe jointly, more than two thirds of the land likely to be planted for any purpoſe in the country; and, as to the former, a little reflection will ſhow, that an expenſive preparation is perfectly unneceſſary, as nature has, in a great meaſure, fitted

them for the purpoſe it is intended to ſerve, namely, to provide a looſe ſoil, in which the roots of the plants may meet with but little obſtruction.—Sands are generally found *light enough;* and, therefore, the difficulty chiefly reſts in the *foul* condition in which they are often found; but, even in ſuch caſes, a fallow may and generally ought to be avoided; as moſt ſands are, to a conſiderable depth, as favourable to the production of trees as the ſurface; and, therefore, we have only to diſcard the turf, &c.—and then to looſen the ſand below, and ultimately to plant in a hole ſome inches deep*.

* The advantages of this method ſeem evinced, by what has happened, in the laſt ſeaſons to the planters on the ſands in the neighbourhood of Sherwood Foreſt. *There*, I am told, many have loſt more than half their plants, in conſequence of the long continued and exceſſive drought. In the planting done there, under my direction, the above method was followed, in conſequence of the land being extremely foul, upon

Undoubtedly, a fallowed ſurface would occaſion the trees to grow quicker in the firſt place, but there are ſeveral drawbacks upon that advantage; as firſt, the loſs of plants would be much greater in the firſt inſtance, as they would have neither ſhelter nor ſhade, as in the other caſe;—ſecondly, the vegetable matter, previouſly upon the ſurface, would be loſt to the trees; which, otherwiſe, would be found highly beneficial, after they get ſo cloſe as to ſmother and rot it.—The greateſt drawback, however, remains;—the expence

which, the loſs has proved trifling, except, in one inſtance, being part of a plantation of about twenty year's growth, where the plants failed generally in the firſt inſtance, while they did well on three ſides of it; as was the caſe with a quick hedge on the fourth:—*there* we loſt about half the quantity planted, being larch and ſpruce firs only.—As there ſeems no way of accounting for the failures on this ſpot, but by ſuppoſing ſome latent defect in the ſoil, I purpoſe to try to remedy it by expoſing a quantity, from each failing hole, to the influence of the atmoſphere, during the coming winter.

of the fallow, which, in itſelf, would be more than ought to finiſh half the planting; and, therefore, though it may often be practicable, it can but ſeldom be proper.

As to heathy ſoils, we find many of them to differ but little from the laſt, ſo far as the production of trees is concerned; becauſe a thin cruſt of ſuch ſoil, upon a ſandy bottom, is extremely common; which is fortunate to the planter; as he needs but to diſcard to the black ſurface Earth, and to plant, in the ſand below, as directed for the laſt caſe.

In regard to deep heathy ſoils, they are only qualified for the production of the Scotch Fir; and that article is well known to poſſeſs the property of penetrating into ſoils the moſt tenacious; and, hence, it may be ſaid, to require but little aſſiſtance from either the plough or the

ſpade; and yet, with a ſort of hardihood almoſt proverbial, it is one that ſuffers meterially from expoſure in the firſt inſtance; a fact which many planters have experienced much to their coſt.—It happens, that moſt heathy ſoils are, likewiſe, *expoſed*; and, therefore, a preparation, which would extirpate the heath, its natural ſhelter, would endanger the ſucceſs of a great proportion of the plants; and therefore, though very expenſive, it is far from a ſafe method.—In ſome caſes, where the heath is very long, it may occaſion great difficulty in the holing, and, likewiſe, the ſmothering of many of the plants. In this caſe, the beſt method is to burn it down, at leaſt one ſeaſon (but better if two ſeaſons) before planting; as, otherwiſe, the expoſure would occaſion the ſort of loſs juſt mentioned.

Perhaps our knowledge of the internal ſtructure of plants is too limited, to en-

able us to define clearly the ſtate of languor or diſeaſe, into which they are thrown by removal, or the ſeparating of that intimate connexion which ſubſiſted between their roots and the ſoil. Still, experience teaches us, that certain cauſes will produce certain effects; and it is from careful obſervations on theſe, jointly, that we come to a tolerable knowledge of what is neceſſary to the ſafe removal of trees. We know, for inſtance, that, on elevated ground, much expoſed to the weather, the froſts and winds of a very moderate winter will kill a tolerably large fir, though it ſhould be removed with the whole of its roots, and planted with every poſſible degree of care; and, likewiſe, ſtaked, ſo that the wind could ſcarcely move it at all.

As, in this caſe, the plant might be obſerved to be in a dead or dying ſtate, before the want of moiſture could have con-

tributed to produce ſuch effect, we can impute it to nothing but the cold; becauſe had the ſame tree been planted in a ſhelter, and ſimilarly treated, it would certainly have ſurvived its removal.

We know, alſo, that the more we reduce the roots of plants in general, (particularly firs,) ſo much the more are they ſubject to ſuffer in removal.

A plant, which retains only its largeſt roots, requires a greater degree of heat and moiſture, to ſet its vegetative powers in motion, than one which likewiſe retains its ſmall ones. We can ſeldom remove a tree without the loſs of a part, (generally a large proportion) of the latter; and hence we infer the neceſſity of ſheltering firs, in the firſt inſtance, as far as the circumſtances of the caſe will admit; and, alſo, the propriety of managing, ſo that they may require as little of it as poſſible.

We can, for inſtance, remove a Scotch fir, of one foot high, without loſing many of its ſmall roots, while one of two feet would, in that operation, loſe moſt of them.--Almoſt any ſituation naturally produces what will, in a greater or leſs degree, ſhelter the former, while very few will afford it to the latter. This fir is, at beſt, a bad rooted plant, or one which makes but few roots, and theſe long ones, in proportion to its height; therefore, by conſidering all theſe circumſtances, it is preſumed, the cauſes of the heavy loſſes that ſo frequently follow the planting of large ones, on bleak ſituations, may be naturally accounted for.

Conſiſtent with the above ideas, independent of avoiding a heavy expence, I never adviſe the breaking up, and, of courſe, leaving bare, an expoſed and heathy ſoil, but, inſtead of it, make holes among the heath, (in the manner that will

be directed;) conſtantly making uſe of plants ſmall enough to be ſheltered, and yet not ſo ſmall as to be ſmothered by it; of courſe, they are planted both in ſhelter and ſhade.—The former prevents their being ſtarved, in the way that has been mentioned, and alſo prevents *wind-waving*, which would otherwiſe form a cavity round their ſtems, ſo as to admit of drought, and occaſion conſiderable loſs.—The latter, by partially excluding both the ſun and wind, prevents them from much exhauſting either the moiſture of the ſoil or the juices of the plants; and hence the buſineſs of vegetation muſt be earlier ſet in motion, and more regularly carried on, than where the caſe is otherwiſe.

Having now attempted, at leaſt, to develope the principles which ought to influence the practice of planting ſandy, light, and heathy ſoils, wherever economy

is a leading object, we may next advert to the case of stiff ones, which are confessedly the most difficult; because, though it may be easy to cause the plants to *grow* on *them*, it is quite another thing to cause them to *thrive*; and, therefore, except where particular circumstances call for it, I am no advocate for planting such as are more than moderately tenacious, especially if they, likewise, prove *shallow*. It is admitted, that a tolerably strong soil may be highly productive, in some species of timber; more especially, if deep:—a thin, stiff one, however, cannot be so productive, as both its quantity and quality have a direct tendency to stint the growth of the plants, in all seasons, but more particularly so in dry ones.

When the planting of such soils becomes necessary, it is a fortunate circumstance if they happen to prove in grass, and capable of being ploughed; as, in

Preparation of soil for fallowing

that caſe, the eaſy means are afforded of bringing the roots of the plants and the rotted ſward in contact;—the latter of which will not only produce nutriment for the former, but a more eaſy means of extending themſelves, in every direction, in ſearch of it. A ſoil naturally ſtiff becomes abundantly more ſo, by being long under tillage: by fallowing we can clear ſuch of noxious weeds, but cannot prevent them from running together again in conſequence of the next ſteeping ſhower.

The beſt method I know, of preparing ſuch for planting, is to plough them, and take a crop of any ſort of grain they will produce, the ſeaſon before they are intended to be planted; wherever a choice is preſented, that which will be moſt ſmothering ſhould be preferred, as having the greateſt tendency to rot the ſward.—In autumn, after the crop had been reaped, and the ground moiſt, but not wet, it

ſhould be well harrowed, and that immediately followed by holing with the ſpade; which work ſhould be done by *chopping the ſoil* to the width of about a foot, but not deeper than the furrow, and then placing it round the ſides of the hole, rather flat, ſo that the froſts may eaſily penetrate it during the winter.

As the difficulty of working ſuch ſoils is obvious, ſo there is a neceſſity for attending to them juſt at the critical ſeaſon, ſuch as we uſually experience, repeatedly, in autumn; it can be of little conſequence whether it prove in September or October, ſo that the ground be in proper order.

And obſerve, it is more ſafe to plant ſuch ſoils rather late in ſpring, than early; as, in the latter caſe, the ſoil would ſeldom be found dry enough; and hence the plants would be crammed into a clod of clay; and would, likewiſe, be in

danger of being thrown out of it, by ſuch frofts as might happen afterwards, without being at all benefited by ſuch as had happened before. On the contrary, by late planting, we ſecure all the benefit of the winter's frofts, without the danger from them juſt mentioned; and, likewiſe, can plant when the ſoil is ſufficiently tender, but not ſo wet as to ſtick together; with little danger of ſucceſs. Under this management, it is meant to make uſe of part of the harrowed ſoil, on the ſurface, by drawing it round the trees, ſo as to raiſe the former ſurface about two inches, to the breadth of about eighteen. The reaſon for this is, to afford the opportunity of placing the trees ſufficiently deep, without putting their roots lower than the track of the plough, and the direction of the diſcompoſed turf; a matter highly important to the growth of the trees. Such ſoils certainly afford but few advantages, and, therefore, there is ſo much

the more reaſon to avail ourſelves to the utmoſt of ſuch as we find. Conſiſtent with what has been advanced, the beſt plants for ſuch ſoils will be the Scotch and ſpruce firs, with the witch elm and the birch; the firs not more than nine the others about twelve inches high.—The variety may be increaſed by other ſpecies; but it is preſumed, in ſuch caſes, the above will generally be found the quickeſt growers.

In ſoils of the above deſcription, which are incapable of being ploughed, the reverſing of the turf is indiſpenſible; becauſe the ſurface ſoil will be abundantly more light and fertile than lands of the ſame ſort, which have been often turned and mixed by the plough. Indeed without *turning in the ſurface*, in order to put the beſt ſoil in the direction of the roots of the plants, I know of no method

of planting, in ſuch a caſe, with any rea-
ſonable chance of ſucceſs.

The method will be to turn the turf completely, with all the ſoil adhering to it, with the ſpade, in as large portions as may be found convenient; as ſuch method would not only be the moſt expeditious, but under it, leſs of herbage would vegetate, than if turned in ſmaller portions; it would, likewiſe, afford the means of planting in the centre of the flags, which of courſe, would be for ſome time, tolerably, clear from weeds; hence much of the danger of ſmothering the ſmall plants would be avoided.

On ſuch lands, we uſually find a very tough ſward, which ſhould be in a meaſure reduced, either by a crop of grain, or being fallow through the following ſummer. Certainly nothing would, ultimately, be loſt by the delay: for as, after it, the

ground would be found mellowed, and the herbage rotten, ſo the riſk from drought, which otherwiſe would be conſiderable, would be nearly done away, and the plants for two or three years, be found to grow much quicker than if planted a year ſooner.

As ſuch turning the ſoil is to be conſidered as tantamount to the ploughing directed in the laſt caſe, the ſeaſon for the operation, and method of making the holes, ſhould be the ſame; and the ſame will apply to the manner of planting, ſize, and ſpecies of trees, &c. only as here there is no harrowed ſurface; therefore the ſoil to deepen that immediately round the trees, may be collected from any other part of the ſurface, where it is found in the beſt condition.

A ſoil ſimilar to the foregoing, previouſly under tillage, is among the caſes by no means favourable to the hopes of the

planter; if, however, he has particular reaſon for planting them, he muſt likewiſe reſort to particular means of preparation; the moſt effectual of which would be found to be a fallow, ſo far complete as to irradicate not only the perennial, but the greater part of the annual weeds; for, otherwiſe, they would inevitably ſmother a great proportion of the very ſmall plants, which alone are proper for ſuch ſituations, except the additional expence, of hoing among them for two ſummers, was ſubmitted to. It is not here ſuppoſed, that the moſt complete fallow would entirely preclude the neceſſity for hoing, or, at leaſt, cutting down part of the weeds, but it certainly might very materially reduce the buſineſs. An autumn fallow is as peculiarly fitted for the irradication of annual, or weeds produced immediately from the ſeeds previouſly lodged in the ſoil, as a ſummer one is for the deſtruction of ſuch as are produced from roots. It is

among the diſadvantages of fallows, made preparatory to the ſowing of wheat, that the grain is uſually ſown about the time when the ſeeds of weeds are moſt of all diſpoſed to vegetate, on the ſoils under notice; a very unfortunate circumſtance, but not at all applicable to the caſe in hand; as here the ſtirring of the ſoil, which occaſions the deſtruction of ſuch weeds, may be protracted to a much later ſeaſon. In mild autumns, we often find ſeeds to vegetate freely to the latter end of December, it is not then too late to ſtir the ſoil, if it do not prove too wet.

The neceſſity for forming ſuch lands into ſomewhat narrow ridges is evident, for otherwiſe the water would lodge *in* and *upon* them, in winter; which would not only damage the plants, in the firſt inſtance, but cauſe the ſoil to bake ſo hard, in ſummer, that the trees would make but little progreſs in it. The ſoil from

the furrows would likewiſe be beneficial, by contributing to the general depth. If it be objected that ſuch ridges would confine the ſpreading of the roots, it may be anſwered, that, before the plants could require much ſpace, a ſoil would be accumulated in the furrows, (except on conſiderable declivities,) ſufficient to cover the ſmall fibres, ſo that they would croſs them; after which, the plants would derive ſupport from the adjoining ridges, in addition to their own.

In lands ſomewhat ſteep, the ridges had beſt be formed with a moderate fall *aeroſs* the declivity, and theſe again croſſed by ditches, at from forty to ſixty yards diſtance, to take off the water, and prevent it from waſhing the ſoil down the furrows.

The ſpecies of plants for this purpoſe ſhould, of courſe, be the ſame as in the foregoing inſtances; but the ſize ſhould be

leſs, as ſuch are beſt qualified to accommodate themſelves to theſe unfavourable ſoils. The beſt ſizes, I conceive, to be Scotch firs of two years old, ſpruce three ditto, birch two ditto, and witch elms the ſame; all of which ſhould have been one year tranſplanted, in order to improve their roots. Where variety is an object a few of other ſpecies may be put in the margins; ſuch as the oak, ſycamore, hornbeam, mountain aſh, laburnum, &c. as all of them will grow, though not ſo well as the foregoing; the ſizes ſhould, of courſe, correſpond with the others.

Before I diſmiſs the ſubject of thin ſtiff ſoils, it may be well to impreſs upon the mind of the reader the peculiar uſefulneſs of the Scotch fir in ſuch ſituations; as, by its ſhade and ſhelter, it tends at once to meliorate the atmoſphere, and the ſoil. The former is obvious; and, as to the latter, no plant is ſo well qualified to thrive

upon them, and of courſe, ſo ſpeedily to ſmother and decompoſe the vegetable matter they produce; indeed, from the time it gets to fix or eight feet high, the rotting of its ſpine furniſhes not only a nutriment, but a conductor for the roots of the other trees; as its *foil*, ſhelter, and ſhade all contribute to promote their ſpreading; and, of courſe, their ſucceſs in the ſearch of that eſſential article *food*. A root, protected by the ſhade of a Scotch fir, will travel, as it were rapidly and in ſafety, not *upon* but ſo near the ſurface that, by the time it gets half an inch in diameter, it frequently burſts its ſcanty covering, after which, we may perceive to a demonſtration, that every part of the foil is completely employed in ſupport of the trees.

The management of a ſtiff and ſomewhat deep foil, capable of being ploughed, will differ in three reſpects, from the firſt caſe; as firſt, the furrow ſhould be as

deep ploughed as could be laid tolerably flat; fecondly, the harrowing may be omitted, as the trees may be planted level with the furface: thirdly, firs, of a foot, and deciduous trees, of eighteen inches, may be uſed. Where ſuch lands have been previouſly in tillage, a fallow will be neceſſary, if the ground prove foul, but if not, it may be diſpenſed with; as where plants of ſizes as above are uſed, trifling attention will prevent them from being ſmothered.

Where ſuch ſoils are incapable of being ploughed, holing with the ſpade ſhould be reſorted to in autumn. The ſize of the holes about fourteen inches wide, and ten deep, if the ſoil will permit. When one hole is made, the ſward from the next is to be taken off, and placed with the graſs ſide downwards, in the firſt. About one third of the remaining ſoil may then be thrown upon the ſward to preſs

it down, and promote its rotting; and the other two laid close round the hole, not in large lumps, but broken a little, so as to benefit the more by the winter's frosts. This case would require plants of the same sizes as the last.

The previous preparation, of once ploughing and a crop of grain, is certainly applicable to every soil, that has been some years in grass, and is capable of being ploughed; it being not only a *good* but a very *cheap* method; the difference in value between a crop of grain and one of grass being generally in favour of the former, considerably more than the expence of the ploughing.—Undoubtedly this method leaves the ground in a situation peculiarly calculated to forward the spreading of the roots, and to promote the general growth of the trees; and, besides, the holing after such crop, would only cost about half as much as after grass. The general differ-

ence of management for a thin and a deep foil has been juſt adverted to.

While recommending the uſe of the plough, the caſe of a thin chalk foil naturally preſents itſelf; as theſe have been found abundantly productive in many valuable ſpecies of timber; mean time, the elevations in which they are very commonly found, ſtand in the utmoſt need of ſhelter; while the loſſes which have followed planting ſuch of them as have been long under graſs, ſhows clearly the difficulty of the buſineſs. Generally theſe loſſes have happened from the circumſtances of drought and expoſure; and, therefore, means ſhould be uſed to guard againſt both. To effect the former, in an eaſy and cheap manner, I know of no means ſo proper as the ſort of ploughing and cropping juſt adverted to;—ſtill it will ſometimes happen, that the ſoil will not be productive in grain; but, even in that caſe, the ploughing will apply; if

the ſoil is too poor to make it deſirable to ſow grain, the loſs in letting it lie fallow for one ſeaſon cannot be much; it muſt, at leaſt, be abundantly compenſated in the ſucceſs of the plants.

As thin chalk ſoils are generally rather light, they do not require to be long expoſed to the froſts; and hence ſo much the more time may be allowed for the ſward to rot, before part of it be turned up by holing. It may lie reverſed from October in one year to December in the next, or fourteen months, and ſtill leave time enough for the froſts to operate, ſo far that the ſoil may eaſily be ſeparated from the graſs roots.

The difficulty in planting ſuch ſoils is threefold;—for, if planted early, the froſts often throw the trees out of the ground. If planted late, the drought frequently kills them; and generally the expoſure is

ſuch that many of them fail by that means. There is, however, a method of protecting the plants againſt all theſe evils, which, in common caſes, cannot coſt more than 8s. or 10s. extra expence, per acre: it ariſes out of, and forms a neceſſary appendage to the method already pointed out; it is this:—After the trees have been planted in the uſual manner, part of the furrows, moſt diſtant from the trees, is cut into lengths of about twelve inches each; and one of them laid on each ſide of every plant, not cloſe, but ſo as to form a cavity, juſt wide enough for the lower branches not to be preſſed together by the ſoil: the direction of the cavities muſt croſs the principal current of the wind.

The way in which this ſimple proceſs effects the ſpecified purpoſe, is almoſt too obvious to need explanation; but, as it applies to a branch of the art which cannot be too much extended, I may obſerve,

that the pieces of the furrows ſo applied, prevent either the ſun or wind from drying the ſoil, otherwiſe extremely thin. They, likewiſe, prevent the froſts of ſpring from penetrating ſo low as the roots of the plants; which, by congealing the moiſture, raiſe the ſurface; and hence either looſens, or throws them out of the ground; of courſe, by this method, planting may be done *early*; a matter highly important on thin light ſoils: on theſe it is alſo very deſirable to plant as ſhallow as poſſible; by this means, the higher parts of the roots may be placed not only level with the ſurface of the ground, but ſomething above it, by drawing together a little ſoil to cover them.

As this caſe admits of only very ſmall plants, ſo the ſhelter from wind-waving, afforded by the flags, would be conſiderable; for as the firs, which are moſt of all ſubject to ſuffer by it, ſhould not be more

than five to ſeven inches high, the broad or branched part of them would be ſcreened, ſo far that the plants could be little damaged by it.

As, in this caſe, there is no danger from weeds, very ſmall plants only ſhould be made uſe of; ſay larch and Scotch firs of two years, ſpruce ditto, three ditto, aſh, beech, birch, ſycamore, &c. two ditto, all of which ſhould have been tranſplanted.

The quantity of each ſpecies ſhould be varied, in proportion to the expoſure: where moſt bleak, *there* a conſiderable proportion of the Scotch firs, with a tolerable quantity of the birch, ſhould be uſed; where leaſt ſo, the other articles will be more proper; more particularly, the larch; it being, all circumſtances conſidered, by far the moſt beneficial article that can be planted on ſuch ſoils; and hence, in planting of *them*, the ſheltering of *it* ſhould al-

ways be matter of the firſt conſideration; and, for that purpoſe, the Scotch fir and birch will always deſerve a preference.

The general uſefulneſs of both, for ſuch purpoſes, is well known; ſtill it may be uſeful to remark here, in regard to the birch, that, on ſuch ſoils, it uſually riſes faſter, and hence overtops and crouds the other trees. When, as this happens frequently, in four or five years after planting, it will be proper to cut it down cloſe by the ground, early in ſpring, which will occaſion it to form ſeveral ſhoots inſtead of one ſtem; each of which, producing numerous branches, placed low, will form a very cloſe ſhelter;—generally in the courſe of the firſt ſummer, they will riſe to be as high as the trees they are intended to protect; ſo that, early in the ſecond, ſuch plantations will appear to be riſing much more regularly, and better ſheltered than before.

Perhaps no better proof can be advanced, of the want of a good method of planting thin chalk ſoils, than the conſiderable loſſes in plants ſo frequently found upon them; and this fact again points out the uſe of ſome directions, in regard to replacing ſuch failing plants. As ploughing is, in this caſe, out of the queſtion, ſo the method that neareſt approaches to it ſhould be adopted; which is, to cut out the whole ſoil, (ſward included,) where the trees are intended to ſtand, in circles of about eighteen inches diameter; and to turn theſe, with the graſs downwards, into the ſame holes they were cut from, the time for rotting the ſward, and the other circumſtances of this caſe, ſhould be the ſame which has juſt been detailed, with this difference, that, upon account of the ſhelter from herbage, &c. the plants may be larger, and they may uſually be conveniently protected from drought and ſpring froſts

by making uſe of part of the graſs, to cover the raw ſurface round them.

The method of preparing any ſoil that is deep and light, need not be long dwelt upon:—If the principles already advanced be duly attended to, it will not be difficult to diſcover, in regard to them, what may be proper; and the reverſe for different ſituations. Generally, it may be obſerved, that the more of vegetable matter there is found upon the ſurface, and the greater will be the advantages to be obtained from turning it in;—and certainly no means is ſo practicable, in large deſigns, as the uſe of the plough, followed by a crop of grain. In good ſoils, producing rank herbage, there is always great danger of ſmothering the trees, except they are planted ſo large as to greatly enhance the expence, and be in other reſpects improper. By uſing means to rot the herbage, we change what would otherwiſe deſtroy the plants, into a

nutriment highly beneficial to them; indeed, by ſo doing, they are ſoon enabled to riſe above danger from ſuch circumſtances. It is true, that, under this proceſs, we may ſtill expect ſome quantity of weeds, but they would be ſuch as would be much eaſier kept down, than a general crop of graſs, &c.

On lands light but poor, the quantity of vegetable matter upon the ſurface is ſeldom great, nor is there much danger of the herbage ſmothering the plants; and, therefore, the ſimple method of holing, by turning the produce of the hole *making*, into that *laſt* made, will frequently prove the moſt proper as well as convenient. Undoubtedly there are perſons who wiſh to reſort to the *beſt methods* only, without regarding the expence; particular ſituations warrant an extra expenditure. In the bulk of caſes, however, the fact is different; and, therefore, we beſt promote

the buſineſs by duly attending to cheapneſs of method.

As light ſoils do not require the operation of froſts to reduce them, ſo where there is no ſward, or not many large or root weeds, it may be ſufficient to only *turn over* (and break the ſoil where needful,) in the places where the trees are to ſtand.

The method of preparing ſmall patches of ground for planting, by digging or trenching, is well known to every practitioner; and, therefore, is only introduced here for the purpoſe of obſerving, that wherever ſuch expence is thought neceſſary, the keeping the ground clean, for two or three years, or till the plants will, in a great meaſure, ſmother the herbage, will generally prove the ſame: for where quick growth is eſſential, cleanlineſs of appearance is uſually of conſequence. Slight

crops of potatoes, with ſhort tops; or turnips, may be admitted into ſuch plantations with advantage, for two or three years, as they create a neceſſity for annually digging or ſtirring the ſurface, and tend very materially to accelerate the growth of the plants. It may be objected, that ſuch crops muſt impoveriſh the ſoil, and no doubt but ſuch is the fact, ſo far as common vegetables are concerned, but as to the production of wood, it has already been ſhown that its ſupport depends, in a great meaſure, on a different ſpecies of nutriment; and hence I could never obſerve that ſuch cropping damaged it materially.

Preparation of ſoil. Small patches of grain

The preparation of rocky ſoils proves ſometimes rather difficult, yet certainly moſt of them, which are of little value for the general purpoſes of agriculture, are qualified to be highly productive in timber; and hence ſuch little difficulties ſhould

Rocky ſoil.

Reparation never be permitted to ſtand in the way of ground planting them.

Rocky Soil.

It is of much leſs conſequence than moſt people imagine, whether trees are planted regularly, ſo as to cover the whole of the ſurface, or irregularly, (clouded,) as will often be the caſe on rocky ground; for, in either caſe, the whole of the ſoil will be completely occupied to a conſiderable depth. Where we cannot plant regularly, upon account of the rocks, the trees ſhould ſtand ſomething cloſer than ordinary diſtances round them; becauſe there all of them have an extra ſupply of air, and moſt of them ſufficient of ſoil. At planting, however unfavourable appearances may be, it is not poſſible to know what particular plant or plants will not ultimately thrive, providing ſoil enough can be found to cauſe them to grow in the firſt inſtance.

The holes in ſuch ground have generally been made by the alternate uſe of the ſpade and mattock, a very tedious proceſs; in lieu of which, I have, for many years, made uſe of the latter only,(a) the tool being peculiarly adapted to the purpoſe, *(ſee the frontiſpiece;)*—the ſward being taken off as thin as poſſible, with the broad end, and the ſoil looſened *in the hole* with the other, inſtead of taking it out and laying it on the ſides, in the cuſtomary manner. In this operation, the larger ſtones are taken out, ſo as to leave broken ſoil in the holes, ſufficient in quantity to plant trees, of the intended ſize; generally a ſmall one.

Where few ſtones are found, the ſoil left will uſually fill the hole; where there are more, it is frequently left hollow, as on light open ſoils;—it is of little conſequence whether the trees be placed level with the ſurface or not, ſo as they have

(a) In good ground the ſpade only ſhould be uſed.

but a ſufficiency of ſoil to grow in. It muſt alſo be obſerved, in regard to this proceſs, that no regard is paid to burying the herbage,(a) as it uſually proves of a nature that would not ſpeedily rot; hence after much trouble in regard to it, it would be found to conſiderably incommode the buſineſs of planting.

(a) Death must not be buried. See p. a. 162.

It may be obſerved beſides, that where light ſoils are ſo fertile as to produce herbage that will readily rot, that ſoil alone will be ſufficiently fertile for trees to thrive in. In ſhort, by keeping the mattock tolerably thin, the herbage is taken off with very little ſoil adhering to it.

Frequently, in making theſe holes, the ſcarcity of ſoil renders it neceſſary to break down more of ſome ſide or ſides of the hole than was firſt bared, in order to increaſe the quantity of earth; in this caſe, little regard is paid to the ſurface herbage

as the tool to be employed in planting will readily ſeparate it from the ſoil, after the latter has been expoſed to the winter's froſts. If, in making a hole, a ſtone be found too large to be readily taken out, it may be left in, and the hole made to one ſide of it; regular diſtance being, as before intimated, found to be of little conſequence.

In preparing the ſides of ſteeps, the herbage is found particularly uſeful in forming a ſort of buttreſs to ſupport the ſoil; as here it is of importance to plant trees on a level, in order to hold the water in its deſcent. In this caſe, it is not ſo neceſſary to pare the herbage thin, as on levels; for the greater part of it gets covered ſo as to rot, and ſoon becomes beneficial to the plants. Perhaps no ſituations, inacceſſible by the plough, can be ſo effectually and cheaply prepared for planting as precipices; ſeeing a quantity of ſoil is very readily moved, by working it down the hill

Preparation of soil. Steeps. with the mattock, to form the levels for the trees, large enough for the roots to ſpread in freely, and likewiſe to retain the moiſture; hence the only diſadvantage of ſuch *ſteeps*, ſo far as planting is concerned, may be eaſily obviated.

Stony & heathy soil. On ſoils at once ſtony and heathy, (a caſe very common,) the mattock proves peculiarly ſerviceable, in moving the one and cutting the other; matters extremely difficult to be performed with the ſpade; certainly, without the uſe of ſome ſuch tool, the expence of planting, upon many ſituations, would be greatly enhanced. It will be obſerved, that, in preparing heathy ſoils, the method is juſt the ſame as on rocky ones; the heath being ſtruck off as thin as poſſible, and the ſoil ſtirred and left in the hole.

Heathy soils.

In cloſing the ſubject of preparation, I would obſerve generally, that every ſoil,

intended to be planted, will be benefited by being broken up, ſome months previous to planting: on ſtiff ones, the reaſon of this operation is obvious, froſt is neceſſary to reduce them. It is not ſo eaſy to ſay why a light one, which has been long broken up, retains moiſture better than one newly done, but the fact is well known; and, therefore, though no advocate for early planting, I am decidedly ſo for autumnal preparation, in every caſe where it is convenient.

The diſtances proper for foreſt trees to be planted, have been much the ſubject of diſcuſſion; on this head I have had but one opinion, for many years. In general caſes, a diſtance of four feet is certainly cloſe enough;(a) as, at that ſpace the trees may all remain till they become ſaleable; as timber, rails, ſpars, &c. are of conſiderable value every where; ~~fine~~ wood only in ſome places. Where the produce, ne-

(a) Intervals of 6 feet recommended for Poplars — Jra. 76. — The order ſhould not be in right angles, — thus ⁘ but thus —

ceſſary to be thinned out of a plantation, is of conſiderable value, there is little danger of this buſineſs being neglected. Where it is of little, the reverſe proves almoſt conſtantly the caſe; few men can ſet about thinning a plantation, which is not likely to pay well for the trouble, without conſiderable reluctance.

Another ſtrong objection to thick planting is the extra expence thereof;—at three feet apart, an acre requires 4840 plants; at four only 2722; a difference of more than two fifths; or thus in the latter caſe, three pounds will plant more land than five in the former; the difference is indeed ſo ſtriking, that, unleſs better arguments be advanced in ſupport of the former diſtance than I have yet heard, I ſhall continue to be an advocate for the latter.

It is admitted, that elevated expoſures ſhould be an exception to the rule, but

38	30
39	29
40	27

even here I conſider three feet diſtances as too little, becauſe, by ſtanding ſo cloſe, the plants ſoon deſtroy each other's branches; hence, when we begin to thin, we find the removal of every tree makes an aperture which there is no means of repairing.

Diſtan... proper ... plantin...

and a half

At three feet diſtance, the plants will ſtand about one fourth cloſer than at four; and, from repeated obſervations, it appears clear, that few foreſt trees grown cloſer, will be ſtrong enough to ſtand erect in expoſures. I, therefore, ſee no reaſon to recommend planting at leſs than the former diſtance.

Respecting the ultimate diſtance — See Foreſt Orner pa. 196.

In regard to the ſizes of trees for planting, the particular caſes have been mentioned where very ſmall ones would be proper: the beſt general rule is, to proportion the ſize of the plants to the goodneſs of the ſoil; the beſt of the latter

Size of Plants.

in an acre be the diviſor. — The product will be the Anſwer. Thus —

Feet — 4 × 4 = 16

Feet 16 | 43560 (2722
32
115
112
36
27

Size of Plants

requiring the largeſt of the former. Still on bleak expoſures this rule will not hold good, as there the plants ſhould never be large, for otherwiſe the greater part would fail from the circumſtance of wind-waving, and of thoſe that ſucceeded, few, if any, would make much progreſs for ſeveral years: firs of a foot, and deciduous trees of eighteen inches, are large enough for ſuch places, if the ground prove but indifferent, and have no ſhelter upon it; but if it be good, ſo as to produce ſtrong and tall herbage, plants of ſomewhat larger ſizes ſhould be admitted, as thoſe of the ſmaller ſize would be in danger of being ſmothered.

However as, in planting large deſigns, ſoils which are good and well ſheltered but ſeldom occur, the moſt uſeful ſizes of plants, for general purpoſes, will be the ſame juſt noted: viz. firs of a foot, and deciduous trees of eighteen inches. When mentioning the ſizes of trees, it ſhould

n planting seedling oaks - see Hunter's Evelyn
ia. 77. 82.

always be underſtood of tranſplanted ones; becauſe, in at leaſt nine inſtances in ten, ſuch are ſtiffer and better rooted than ſeedlings: ſtill it ſometimes happens that, in conſequence of a thin crop, ſeedlings may have every requiſite good property, and ſo far there is no objection to their uſe.

It may be obſerved too, that none but good rooted plants will ſucceed on a bad ſoil, while, on a good one ſheltered, none but very bad rooted plants will fail; a large plant never has ſo good a root, in proportion to its ſize, as a ſmall one; and hence we ſee the propriety of uſing ſuch on good ſoils only. For inſtance, we cannot uſe large plants on ſtiff ſoils with any reaſonable hopes of ſucceſs; and the chance is ſtill worſe if they prove likewiſe expoſed; as neither caſe affords the means of ſpeedily furniſhing the plants with roots that will have a regular proportion to the ſize of their heads;—hence the cir-

Size of Plants

culation of the ſap is impeded, and the plants become ſtinted in growth; under which circumſtance, it not unfrequently happens, that the ſmall quantity of ſap furniſhed by the roots, inſtead of aſcending to the tops, to furniſh leaves and ſhoots, breaks out into ſprigs, by the ſurface of the ground; a clear proof of the impeded circulation juſt noticed.—Small plants, on the contrary, loſe but few of their roots in removal; therefore, though planted in very moderate ſized holes of pulveriſed earth, ſoon find the means of making roots, in proportion to their heads. Beſides, ſuch are in ſome degree ſheltered. In ſhort, *it ſhould never be forgotten*, that as, in being removed, a plant of two feet loſes a greater proportion of its roots than a tree of one, and one of three feet a greater proportion than one of two, and ſo on, in proportion to its former ſtrength and height, ſo the larger the plants, ſo much greater is the ſtate of languor or

Advantages of ſmall Plants.

weakneſs into which they are thrown, by that circumſtance; and hence, in proportion to that ſtate of weakneſs, ſhould be our efforts to reſtore them to their uſual health, by ſuch means as choice of ſoils, preparation, ſhelter, &c. If we can, indeed, manage at the outſet, ſo as to reſtore to them what may be called a good conſtitution, they will generally, afterwards, be found able to contend, not only with the boiſterous elements, but an unfavourable ſoil.

Advant. of small Plants.

In regard to the ſizes of holes for trees, it is to be obſerved, that, on light ſoils, completely broken up, the hole is large enough that will hold the roots of the plant, when extended; on ſtiffer ſoils, a few inches more room is neceſſary. In both caſes it is to be obſerved, that ſome benefit would ariſe from having the holes made early in winter; ſtill that benefit will be in proportion to the tenacity of the

Sizes of Holes.

Diameter or circumference

Y

In a sandy loam, of moderate tenacity, Pontey recommends holes three feet deep in autumn; & trusts to be plenty in three or 3½ feet square

holes should be of the size made by one
spade-full of earth being dug up,
by 3 chips of the spade, bringing up the
with the earth.

Sizes of holes. foil; on ſtiff ones, for inſtance, it will be of much advantage, on ſands of very little. (a)

Circum. ſcribes. On lands not broken up, it is obvious a large hole muſt be, in every caſe, an advantage; but much greater on ſtiff than light ones. A large plant requires abundantly more ſpace, beyond its roots, than a ſmall one, the difference may be as much as from two to eight inches. Depth alſo is of much conſequence, where the general depth of foil admits of it. Still we have no buſineſs to penetrate lower than the ſtrata in which the trees will grow: On ſtiff ones, abundance of miſchief is often done by this means; as it includes the double diſadvantage of putting the roots of the trees, and the beſt of the foil, into a hole capable of holding water, both of which lead to conſequences ſo obviouſly at variance with the ſucceſs of the plants, that, I truſt, it need only be mentioned to be avoided.

Depth

At Slaughum M'Portey recommends the holes to be made in October for planting March, where circumſtances do not

On the whole it is evident, that holes retain moiſture, in proportion to their ſize and depth; and, therefore, except under particular circumſtances of difficulty, ſmall ones are never to be recommended. As to the form of holes, it is to be noted, that they ſhould always be round, and wideſt at the bottom.

Sizes of holes.

Form.

It will be obſerved that, in the general, I am an advocate for early or autumn preparation of the ſoil, with ſpring planting; from a full conviction that, provided the former is duly attended to, but little of loſs would happen under the latter. It is true, that where the former is neglected the caſe proves exactly the reverſe, and moſt generally from the circumſtance of drought, in conſequence of the ſoil not being duly mellowed by the winter's froſts.

Autumn Preparation & Spring Planting recommended.

Sometimes, however, loſſes happen from the plants being dried, by being long

out of the ground; a matter always to be avoided as much as poſſible. That, however, cannot be done completely when they are procured at a diſtance; and, therefore, when ſuch arrive and appear rather dried, the beſt method is to puddle their roots, previous to planting: if they ſeem very much dried, it would ſtill be better to lay them in the ground, for eight or ten days, giving them a good ſoaking of water every ſecond or third day, in order to reſtore their vegetative powers; for it well deſerves notice, that a degree of moiſture in ſoil, ſufficient to ſupport a plant recently, or immediately, taken from the nurſery, would, in the caſe of dried ones, prove ſo far inſufficient, that moſt of them would die in it.—The puddling here recommended may alſo be of great ſervice in all caſes of late planting, where ſmall plants are uſed: my method is (after puddling,) to tie them in bundles, of two or three hundreds each; and thus ſend them, by a

cart load at once, to where wanted; where such bundles being ſet upright, cloſe to each other, and a little ſtraw carefully applied to the outſides of them, may remain without damage in a ſheltered ſituation, any reaſonable time neceſſary to plant them. Where looſe ſoil happens to be convenient, that ſhould be ſubſtituted in the place of ſtraw.

A puddle for trees is made by mixing water with any ſoil, rather tenacious, ſo intimately as to form a complete puddle, ſo thick, that, when the plants are dipped into it, enough may remain upon the roots to cover them.

The proceſs of puddling is certainly ſimple, and its expence too trifling to deſerve notice: its effects, however, in retaining, if not attracting moiſture, are ſuch that, by means of it, late planting is rendered abundantly more ſafe than it otherwiſe

Page, the expence of planting an acre of (say) la
at 4 feet intervals would be (exclusive of plants) 13
of (say) poplar at 6 feet — — — — — 6.
See p. 164.

Puddling would be. It is an old invention, and hence it is truly aſtoniſhing that it is not more frequently practiſed. If we could but perſuade people to adopt it generally, in ſpring planting, I believe the prejudice in favour of autumn practice would ſoon be done away. It is truly aſtoniſhing how generally and ſtrongly that prejudice prevails; I, therefore, beg leave to obſerve here, that it is adviſable only in few caſes, while ſpring planting may properly apply to all. In ſhort, the nature of the buſineſs is ſuch, that a great proportion of it can only be well and ſafely done at that ſeaſon. — The latter end of February and the whole of March will include the planting season.

Method of planting The common method of planting is ſo far known to every Gardener, that little need be ſaid upon it here. It may, however, be neceſſary to explain what may be called a good one.—The root of the plant is to be dreſſed, by ſhortening the ſtraggling, and taking off the broken roots:—

Mr. Cowley says, any good common labourer will plant 1500 roots per day, by this method, in clay, without any assistance — according to others or 1.8th per hour — 200 per hour. 2 men hundred would yield an acre

should be, per hundred trees,—
Digging holes (pa. 169) — 4
Planting — (pa. 174) — 2
In all — 6?
i.e. £5 per thousand — 5?-.-.

The hole is then to be made ready, by either taking out earth, or putting it in, and breaking it where neceſſary; the plant is then to be placed in it, with two or three inches of the ſtem beneath the level of the ſurface; the beſt or fineſt of the ſoil is then to be put to the roots, and diſtributed amongſt them, by ſhaking the plant; in which operation, it ſhould be drawn up ſo as to ſtand very little, if at all, deeper than it did in the nurſery; the reſt of the ſoil is then to be put in, and the plant fixed firm and ſet ſtraight with the foot; after which leveling the ſurface completes the buſineſs.

Two things, in regard to the above practice, I have frequently obſerved to be miſmanaged, viz. the cuſtom of planting too deep, and a bad mode of faſtening the plants. When I obſerve a quantity of plants thriving ill, where the appearance of the ſoil is favourable, I generally ſuſpect the former, and have frequently found

A much more ſimple & expeditious mode of planting is described by D. Hunter & Mr. Silva pa. 77-82 for ſeedling plants. 3.60. & pa. 75. 82. & 290 of 2d Edition.

Method of planting.

ſeveral inches of ſtem within the ſurface of the ground, and the roots of the plants beneath the beſt part of the ſoil; a matter no otherwiſe completely curable than by replanting. The other circumſtance ariſes chiefly from gardeners being little habituated to any but garden practice, and hence on ſomething like garden ſoils they perform pretty well; on ſands, however, they generally leave the plants too looſe, and on ſtiff ſoils uſually fix them too faſt;—the truth is, we can ſcarcely tread the former too much and the latter too little, ſo that the plants, if ſmall, will reſiſt the wind; and as to large ones, they ſhould be ſtaked in preference to hard treading.

Tools.

Having, for nearly twenty years, adopted, what I may be permitted to call, *An improved method of Foreſt Planting;* by means of tools invented for the purpoſe, *(ſee the plate;)* it will be neceſſary here to explain, in ſome degree, their forms

See an expeditious mode of planting ſeedlings with a ſpade: J. Hunter's Ed. 77 & with a gimblet 82.

and uſes:—The firſt is a mattock, made particularly light, with one end about four inches broad and thirteen long, from the centre; the other a pike, its length about ſeventeen inches. The uſe of this tool on heathy, tough, ſtony ſoils and ſteeps, has been already deſcribed, (ſee P. 159—162.)— On good & light ſoils, the ſpade must supersede it. — See pa. 170.

Method of planting. Tools.

The other tools are called planters, the forms of which may beſt be ſeen by the plate. No. 2, is a ſort of hack or hoe, of the length of eight inches from the eye; the face or edge four and a half broad, and the handle twelve long; the heel or part behind the eye is made ſtronger than the other parts of it, in order to act as a maul, in breaking ſuch clods as may be neceſſary.

No. 3 and 4, have been introduced of late years, as improvements upon the foregoing; being better adapted to ſoils

i.e. in lieu of N°. 2. — They cannot supersede N°. 1. — And N°. 1. alone would answer for planting seedlings. — C. S. See pa. 159.

full of roots, ſtones, &c. they are, likewiſe, eaſier to work, as they penetrate to an equal depth, with a ſtroke leſs violent than the former: they are alſo leſs ſubject to be clogged up, by a wet or tenacious ſoil. The length of the prongs of both ſhould be about eight inches, and the diſtances between them, in No. 3, one and a half: (a) in No. 4, two inches: this ſhould be made ſomewhat ſtronger than the former; it being intended chiefly for very ſtony lands, or where the ſoil wants breaking, in order to ſeparate it from the herbage, &c.

No. 5, is a ſection, to ſhow the form and ſtrength of the prongs applicable to No. 3; one of the ſides being to be inwards, or towards the planter.

It will be obſerved, that theſe tools are chiefly applicable to plants of any ſize up to about two feet, or ſuch as are generally

uſed for great deſigns, where they are uſed as a ſubſtitute for the ſpade, in the following manner. The planter, being provided with a baſket holding the plants required, (the holes being ſuppoſed prepared, and the earth left in them,) he takes a tree in one hand, and the tool in the other, which he ſtrikes into the hole, and then pulls the earth towards him, ſo as to make a hole large enough to hold all its roots; he then puts in the plant with the other and puſhes the earth to its roots with the back of the planter; after which, he fixes the plant, and levels the ſoil at the ſame inſtant, with his foot; ſo that the operation is performed by one perſon with a degree of neatneſs and expedition which no one can attain to, who uſes the ſpade. It is known to all planters, that but few labourers ever learn to plant well and expeditiouſly, in the common method, without an aſſiſtant:—This method, however, requires neither help nor dexterity; as

Method of planting.

any labourer of common ſagacity, or boy of fifteen, or even a woman, may learn to perform it well in leſs than half an hour. The facility with which theſe tools will break clods, clear the holes of ſtones, or ſeparate the ſoil from herbage, the roots of heath &c. (the former being previouſly mellowed by the froſt,) may be eaſily imagined.

Shelter

In the foregoing pages, many obſervations have been made on the different ſpecies of trees, beſt calculated for the purpoſe of ſheltering or nurſing each other, ſo far as the general proſperity and value of plantations are concerned. We proceed next to treat of ſhelter, not only as it relates to the above objects, but as it may be made ſubſervient to the improvement of property generally, as well as the immediate vicinity of a family manſion. Here, however, I find two circumſtances completely different in their nature, ſo

intimately connected, that it ſeems the moſt convenient method to ſpeak of them together.

Every one, who has any diſtinct ideas of the nature of trees, will readily agree that they are capable of producing what all the intelligent part of mankind allow to be of the utmoſt value, viz. ornament and ſhelter;—they are indeed ſo inſeparable, from their nature, that it is almoſt impoſſible to plant a large number without, ultimately, producing a conſiderable degree of both:—The fact is, that a thriving plantation, however miſplaced, becomes, with the bulk of mankind, an object of regard, approaching almoſt to veneration; perhaps the idea of utility, inſeparably connected with ſuch objects, goes far in ſtamping the impreſſion.

If ſuch then be the effects of trees, as operating upon the human mind, without

regard to arrangement or propriety of ſituation, we are not to wonder at the aſtoniſhing effects they are capable of producing, when every maſs, group, clump, or individual tree, has its proper place and ſtation, and when their ſpecies, and even forms, are made ſubſervient to theſe purpoſes: for *then* it is, and *not before*, that we ſee what a great profeſſional man would have properly called their natural "capabilities."—The modeſt manſion and the ſplendid palace are equally indebted to their aid; for when the architect, the maſon, ſculptor, painter, and the numerous profeſſional train, uſually employed in decorating manſions of affluence, have exerted their utmoſt efforts, the whole, without trees, may be compared to a beacon upon a hill; an object to be looked at, but not enjoyed, except by perſons who do not ſhare in the common feelings of mankind.

To ſay, in how many ways trees contribute to benefit a country reſidence, would lead me far beyond my preſent object; I ſhall, therefore, only juſt briefly notice a few of them; as, firſt, they add greatly to the ideal ſize and conſequence of the manſion itſelf; ſuppoſe, for inſtance, a houſe to ſtand ſo as to be ſeen in common with other buildings, diſtant hills, the ſky, or any object larger than itſelf, its height and dimenſions will be apparently reduced by being ſo contraſted. On the contrary, ſhould trees be introduced between the building and ſuch objects, ſo that the eye is in a meaſure confined to the contemplation of the former only, it immediately appears increaſed in beauty, ſize, and comfort.

Improvement of property.

Secondly, the ſhade and ſhelter afforded by trees may, if rightly managed, be made to give, what may be called, a new atmoſphere: They will, as far as neceſſary,

Shade & Shelter.

Shade & shelter. equally exclude the impetuous blaſt and the ſcorching ray; and thus it is that they contribute to health, by inviting to the enjoyment of an invigorating excurſion, in every ſeaſon, not unuſually intemperate.

Screen. Thirdly, trees may be generally made the means of *ſhutting in* ſuch objects as appear deſirable, and of *ſhutting out* the reverſe. For inſtance, if the view from the manſion commands ſome beautiful grounds, trees properly arranged will generally lead the eye ſo far to theſe objects, as to give them a force or expreſſion before unobſerved;—and the ſame obſervation will apply to water: a ſmall piece, by artful management, in concealing the terminations with trees, may often be made to appear as a continued river.

Fourthly, by means of trees, the apparent ſize of a lawn may generally be conſiderably increaſed: not certainly by

planting a continued belt round it, as is very commonly practiſed, but by bold projections and breaks, ſo managed that the ground may appear to continue through the latter. Frequently, by the ſkilful uſe of ſuch means, lands not the property of the ſame proprietor may be made to appear part of the demenſe.

Such then being a part (certainly but a ſmall one) of the ways in which trees may be made to benefit a country reſidence, it clearly behoves the proprietors of them to conſider how ſuch objects may be obtained with certainty, for they are not the fruits of chance, but means; and ſuch means muſt be proportioned to the end. It is not the ſtudy of painting, the art of drawing, or a facility of writing large treatiſes, that will qualify a man for the creation of the ſort of rural ſcenery juſt adverted to; nor can the profeſſional gardener, whoſe life has been principally devoted to far different

objects, be ſuppoſed at all equal to the talk; it is only to be expected from the man of genius, taſte, obſervation, and experience; one, in ſhort, who has a head to plot and a hand to execute, not only the great and eſſential, but even the moſt minute parts of the buſineſs.

The works of an ornamental gardener, who reſts in theory only, may aptly enough be compared to baſe coin, it may look well and even *paſs* for a time; by and by, however, it wears worſe, the copper is ſeen through the ſilver, and that again aſſumes the place of the gold; the proprietor laments his loſs, and ſo may, with good reaſon, the owner of an ill planted ſhrubbery, while the deſigner adopts the poets *piteous lamentation*. "Vegetation ſpoils "every thing;" which, by the way, only proves that he could abuſe what he did not properly underſtand. The truth is, that, as ſuch deſigners do not know the

proper ſituations for the different ſpecies of plants, that buſineſs is left to accident, and hence moſt of them prove miſplaced; of courſe, the planting gets gradually into diſorder, in much the ſame proportion as it would have improved, had it been properly executed.

Conſequences of want of skill.

To inſtance one of the many reſpects, in which the works of ſuch deſigners get annually worſe, I may notice the caſe of ſcreens. In the immediate vicinity of a houſe, ſuch things are peculiarly deſirable; and yet very generally miſmanaged. In the courſe of a few years, we uſually find what ſhould continue a cloſe one, poſſeſſing the properties of ſhade, ſhelter, and retirement, degenerate into an open grove; and hence, both its character and uſe are in a great meaſure loſt. Nor can this be wondered at, if men continue to plant and treat both in the ſame manner only.

A little obſervation may ſerve to convince us, that every ſcreen muſt degenerate, in the way juſt noticed, if part of the plants compoſing it have not the properties of growing buſhy, of retaining their branches very low, of producing cloſer heads on being pruned, of ſhooting afreſh from the ground on being cut down, and of growing under other trees. Nor can any ſcreen long retain theſe properties, except they are carefully promoted and encouraged, by frequent attention. Of courſe, a ſcreen ſhould conſiſt of three deſcriptions of plants: viz. trees proper for principals, for underwood, and for the fronts.

As all the grounds, to be planted in the immediate neighbourhood of the manſion, ſhould be prepared by trenching, or digging at leaſt, ſo the principal trees for them ſhould be ſomewhat large; if they differ as much in height as from three to

eight feet ſo much the better, as theſe with the underwood, which ſhould differ in height from three feet to one, would collectively ſoon exhibit a cloſeneſs of bottom and a lightneſs of ſummit; circumſtances without which ſuch ſcreens can never be more than in a limited degree either USEFUL, BEAUTIFUL, THRIVING, or LASTING.

It ſhould be remarked, that, in plantations of this deſcription, trees which form very cloſe heads ſhould be ſparingly uſed as principals: the fir tribe for inſtance, ſhould chiefly be uſed near the verges leaſt ſeen, and more eſpecially where the ſcreens are narrow; as there they ſhould be rather dark; for otherwiſe we loſe much of *apparent* breadth. But it is to be noted, that though ſuch verges ſhould be darkened, this method would have an extremely bad effect, were the cloſe heads of ſuch trees to riſe ſo high as to exhibit a

Screen. cloſe ſummit to the diſtant beholder; as that would reduce the apparent breadth at any ſeaſon, by bringing forward the diſtant outline; the effect, however, would be much the worſt in winter. Still perſons need not be afraid of uſing a moderate quantity of firs, as principals, in ſuch places; becauſe, where they are allowed tolerable ſpace, they ſeldom riſe ſo quick as the bulk of deciduous trees; and ſhould too many appear, ſome of them may be taken down in preference to other ſpecies, when thinning becomes neceſſary; ſo that the effect alluded to might be completely avoided.

Preſuming that an equal quantity of principals and underwood make an excellent proportion of plants for a ſcreen, the method of planting them will be found very eaſy; as the ſize will ſufficiently mark the diſtinctions. If the whole ground is holed, ſo as to plant at three feet diſtances,

and half of theſe are planted with each deſcription, the plants would ultimately ſtand at regular diſtances. It is not intended here to dictate what proportion of each individual ſpecies ſhould be made uſe of, or how mixed, but certainly a regular mixture of either principals, underwood, or front trees, would be one of the worſt that could be adopted.

The liſt for underwood may compriſe all or part of the following; Firſt,—beech, hornbeam, lime, oak, and common thorns, of about two feet high; as theſe will bear to have their heads reduced occaſionally, and will ſpring afreſh from the ground upon being cut down.

Second,—Birch, horſe cheſnuts, mountain aſh, and laburnums of two feet:—theſe ſhoot freely on being cut down, but become unſightly on having their heads reduced.

Third,—Spruce and ſilver firs of one foot;—theſe will grow under other trees where the cover is not very cloſe, and may be made to form broad buſhes, by frequently ſhortening their leading ſhoots.

Fourth,—Common hollies, laurels, box, and privets, of a foot high:—the general properties of theſe are well known; all of them grow very well under trees, more particularly the three former.

In planting of ſcreens it will be neceſſary to leave two ranks of holes, in the principal fronts, open; in the firſt place, in order to be filled with front plants only.—For which purpoſe, the foregoing liſt of underwood will all be proper, with the addition of areatheaphraſti, ornamental thorns, golden willows, &c.—as theſe, collectively, could not fail to form that cloſeneſs and variety of front, which is always deſirable, but very rarely ſeen.

Poſſibly ſome perſons may ſuppoſe, that ſuch methods would be particularly expenſive:—the fact, however, is otherwiſe; for it is to be recollected, the number of plants would be the ſame as is commonly uſed; three feet being the uſual diſtance for ſuch purpoſes: mean time, only half the plants need be large, or of the common ſizes.

If the plants for any given deſign, planted in the uſual method, be ſuppoſed to coſt twenty pounds, we may, by that rule, eſtimate the expence of the improved one, as under:

	£.	s.	d.
Half of the plants being of the uſual ſize and value	10	0	0
One eighth of them double do....	5	0	0
Three eighths of them being of half the common value ...	3	15	0
£	18	15	0

Screen. Here we ſee that, after making ample allowance for ſuch plants as are of more than common value, a perfect ornamental and laſting ſcreen, poſſeſſing every deſirable property, may be planted for leſs than what is uſually devoted to one which proves completely the reverſe; and the circumſtance is the more provoking, as miſmanagement of this ſort is rarely diſcovered till it is almoſt impoſſible to retrieve it: prevention is ſaid to be better than cure; in this caſe, it certainly is abundantly leſs difficult. The former requires nothing but what is eaſy, it is only ſubſtituting a good method in the place of a bad one. The cure can only be effected by much time, conſiderable labour, *ſome ſkill*, and *not a little expence:* ſtill the worſt of it remains to be told; it requires a ſacrifice of trees, too conſiderable for moſt perſons to ſubmit to, without the utmoſt reluctance.

When we conſider, how much the arrangement of the grounds and trees about a place contribute to its embelliſhment and comfort, and, of conſequence, its intrinſic worth; one cannot help wondering that a ſcience which embraces ſuch important objects, ſhould be ſtill ſo much enveloped in myſtery. A bad deſign is often quite as expenſive as a good one; and hence gentlemen could have no inducement to adopt the former in preference to the latter, if they had any criterion or rule, by which to judge of the merits of the one, and the defects of the other.

That this art may be traced to certain and fixed principles, there can be no doubt. If the ſame means never fail to excite pleaſurable ſenſations in the mind of intelligence, it appears that ſuch principles reſt upon a baſis much deeper founded than the faſhion of the moment.

The truth ſeems to be, that, for near a century, taſte in ornamental gardening has been conſtantly verging towards nature and ſimplicity. The beſt ſcenes in uncultivated nature are clearly our beſt models when working upon a large ſcale: and, even upon a ſmall one, we have no buſineſs to completely overlook them. Theſe ſcenes may be ſimple; as where the gratification ariſes from the contemplation of one ſort of object only, as the ground, water, trees, or proſpect: or they may be compound, or ſuch as ariſe from the combination of two or more of them;—generally artificial ſcenery proves of the latter deſcription.

As it will not be diſputed, but that the ſcenery alluded to is calculated to captivate alike the untutored and the cultivated mind, it follows, I think, of courſe, that we have here, what may be called, *the baſis of a taſte founded on nature.* It

will not, however, be ſufficient to diſcover, that ſuch ſcenery pleaſes in the groſs; as in that ſtate it can rarely be the ſubject of cloſe imitation; and, therefore, it will be neceſſary to diſtinguiſh correctly, how far each diſtinct cauſe contributes to the general effect.

It cannot be diſputed, but that an intimate knowledge of the means, by which the beſt effects are produced in natural ſcenery, is neceſſary to combine them in what is purely artificial. In fact, where the moſt of art is exerted, there nature will ultimately appear moſt of all predominant.

I do not here mean thoſe combined exertions of art and labour, which frequently go the length of altering, what may be called, *the genius of the ſpot*, at a prodigious *expence;* but that art which can as it were ſeize upon exiſting circum-

ſtances, and, by ſlight additions, or curtailments, made at a ſmall expence, convert them into what will, at once, harmonize with, and improve, *the natural features of the place.* Certainly a propenſity to more of alteration than is abſolutely neceſſary, is no proof of either taſte or ſkill, but the reverſe. A taſte for expence is one that ought to be ſincerely deprecated; whether it exiſts in the proprietor or the deſigner; as it ſerves to deter perſons, of moderate fortunes, from engaging in improvements that may be abſolutely neceſſary.

Still the greateſt of all diſcouragements to improvements is, the ignorance of the bulk of thoſe who undertake to conduct them.—Undoubtedly, there are many exceptions to this remark: we ſee the men in their works; but, by that rule, which all muſt allow to be an unerring one, we may ſafely pronounce it to be applicable

to a great majority of the profeſſion.—The truth is, they grope their way in the dark; and hence, if they miſs it, it is what might reaſonably be expected: all we can look for from them as original, is a ſomething, which nature and propriety muſt equally diſown; or a clumſy imitation of ſome PLACE they have ſeen.—Perhaps, as matters are circumſtanced, it may be rendering an eſſential ſervice to gentlemen, to furniſh them with a *rule*, by which they may, in ſome degree, *meaſure* the "capabilites" of ſuch perſons as may be introduced to them in the above capacity.—The method might be ſomething like the following:

After ample time has been allowed for obſervation, the perſon ſhould be requeſted to explain the reaſons for every diſtinct projected alteration, and how far each was to contribute to the general effect. He ſhould, likewiſe, be deſired to ſtate the

means to be made uſe of in producing effects ſpeedily, by planting, and how they might be made laſting wherever deſirable; as there is nothing in the above but what every practitioner either has, or, at leaſt, ought to have, clear ideas of.

I am confident, that there is not a man in the profeſſion, who deſerves employment, that would not go through the ordeal with eaſe to himſelf, and in a manner that would convince every one, that he had, at leaſt, ſtudied cauſe and effect, ſo far as applicable to his profeſſion. He would eaſily be able to make the diſtinction, between what might be called the great and what the inferior natural features of the place; and alſo ſhow, in ſome conſiderable degree, how far each might and ought to be worked upon to advantage; and, in doing ſo, he would conſtantly keep in mind what was practicable in itſelf, and conſiſtent with the general circumſtances

of the place.—But eaſy as all this would be to the man of ſcience, to the mere coxcomb and daſhing adventurer it would, indeed, be a taſk, in the performance of which, their deficiencies would be plainly manifeſt. The difference between the reports of ſuch perſons, and that before mentioned, would ſufficiently mark their different attainments; the former would dwell principally upon matters peculiarly applicable to the place, the other on what would be as applicable to any other: the former would tell us, how the work was to be done, and what ſpecies of trees to be planted, *and where;* the latter would content themſelves with talking about ſuch matters generally.

Having ſaid thus much, on the uſes of trees, as applicable to the immediate neighbourhood of a manſion; and, likewiſe, hinted at ſome common circumſtances of miſmanagement, I may now advert

to their value, as ſhelters and ornaments generally; more eſpecially to lands at once bleak and bare, of which the country exhibits many very extenſive tracts.

Some people ſeem greatly alarmed, leaſt the buſineſs of planting ſhould be ſo far extended as to intrench upon agriculture; the danger however, I conceive, lies entirely on the other ſide; for, though an old planter, I have never known much land devoted to planting that was of conſiderable value for corn or graſs, except ſo far as taking a part to improve the reſt, by ſhelter; a ſpecies of planting which, very unfortunately for the country in general, and its agricultural intereſts in particular, has been but little practiſed; perhaps ſcarcely thought of till within the laſt forty years; and which, to the preſent moment, is not practiſed to one hundred part the extent it ought to be.

If any one, inclined to doubt of the truth of the above ſtrong aſſertion, has an opportunity of viſiting Stanmer, near Brighton, in Suſſex, the ſeat of Earl Chiceſter; or Sledmere, in the eaſt-riding of Yorkſhire, the ſeat of Sir M. M. Sikes, I am perſuaded he will find reaſon to think with me, that inſtead of detrimenting, planting may be made to materially *promote* the intereſts of agriculture. Every ſituation that is elevated and bare is, in conſequence, leſs or more barren; the Woulds and Downs, which certainly include no inconſiderable proportion of the culturable lands of the country, come very generally under this deſcription, It is admitted, that they are productive in their preſent ſtate; but certainly that produce would be abundantly increaſed, were they properly ſheltered by planting.

At the two places juſt mentioned, the buſineſs of ſhelter has been worked upon

by planting to an extent, and with a degree of judgment, of which I have ſeen no parallel elſewhere:—indeed, with me, it is a queſtion, whether the immediate deſcendants, or the country in general, are moſt obliged to theſe truly noble minded perſons, the late Earl Chicheſter and Sir Chriſtopher Sikes, who projected and executed theſe equally ſplendid and invaluable improvements? The former will, I underſtand, in conſequence, have a pillar erected to his memory by his noble ſucceſſor. I have not heard that any thing of the ſort is intended in regard to the latter; but ſo much is certain, he has well deſerved ſuch a tribute of reſpect.

Of the value of theſe plantations, as ſhelters, as ornaments, and as producing timber, I do not pretend to ſpeak; further than that it muſt be prodigiouſly great; nor is it poſſible to eſtimate their worth, in the way of example; he muſt indeed be

a cold-blooded mortal, who can contemplate ſuch united utillity and magnificence, without feeling "how low, how little" are moſt of the earthly purſuits, which ſo generally engroſs men of rank, in compariſon of the elevated, I had almoſt ſaid, the ſublime ſcience of planting.

The manner of planting general ſcreens may be much the ſame as in the neighbourhood of the manſion, only rejecting the dearer ſpecies of plants. As here regard muſt be had as well to the future as the preſent, a moderate quantity of the following articles ſhould be introduced as principals, wherever the ſoil proves ſuitable, viz. oak, beech, ſycamore, and the Engliſh elm, the laſt being grafted. The aſh ſhould never be admitted into any other than broad ſcreens, it being a bad ſhelter, and a worſe neighbour.

As enough has been advanced, to explain what is neceſſary to the formation of the moſt perfect ſcreens, I need here only refer the reader back to the ſubject, recommending him, at the ſame time, to attend particularly to what has been advanced, in the former part of the work, on the properties of the larch, ſpruce, and Scotch firs; as, by the proper uſe of theſe, moſt ſituations may not only be completely ſheltered, but the ſcreens rendered highly productive in timber produce.

It may be of importance to obſerve here, that ſcreens, planted for the purpoſe of ſheltering lands of inferior value, ſhould by no means be narrow ones; for though it may be poſſible to preſerve them complete ſhelters, it can only be done by ſuch continued attention as can ſcarcely be expected in large concerns: nor is it poſſible that either the principal trees or underwood ſhould thrive ſo well as in broad

ones. But the beſt reaſon for breadth remains to be noticed:—Such lands may generally be as profitably employed this way as in any other, frequently more ſo: beſides the fencing of the two ſides of a ſcreen, whether it be twenty or a hundred yards broad, will be preciſely the ſame. Of courſe, narrow breadths muſt be the worſt kind of policy.

Shrubs on cultivated lands.

The value of broad ones, as covers for game, is too obvious to need comment.—With moſt gentlemen, the protection of game is a matter of much importance.—Broad belts, partially cut down, from time to time, ſo as to produce a conſtant ſupply of underwood, are peculiarly calculated to encourage the breed. In ſhort, the ſame means that will ſhelter the land, will alſo ſhelter the trees and game: and, with all theſe pecuniary advantages, they are beyond compariſon the moſt ornamental. A narrow belt, on the ſummit of a hill, com-

poſed of trees with naked ſtems only, has none of the properties of a ſhelter, but the reverſe: it is indeed but little ornamental, and leſs uſeful.—The proper ſituation for ſuch ſcreens will be, in ſome degree, obvious. Generally they will be moſt effective on the ſummits of hills. In moſt places, it is known from what quarter the wind blows moſt violently; generally from the weſt:—the rule, however, admits of many exceptions; and, therefore, this point ſhould be clearly aſcertained, in the firſt inſtance; when the direction of the planting will follow of courſe.

Conſiſtent with what has been advanced on planting ſteeps, it will be found deſirable, that the line of the ſcreen to windward, ſhould be as near the ſummit of the ſteep as may be found convenient; as, by that means, much of the current of the wind will be thrown rather over, than in among the trees; and hence they will

thrive better than if the line was lower in the aſcent.

Screen cultivated lands.

When, as ſometimes happens, the current of the wind takes the direction of a valley, it is peculiarly prejudicial. In ſuch a caſe, the line of the ſcreen muſt be acroſs the valley, from the ſummit of one hill to that of the other: and, if ſuch valley continues to aſcend for a conſiderable length, a ſecond ſcreen may be neceſſary. It is not ſaid that ſuch things rank high as ornaments; but they may frequently prove extremely uſeful.

Where it is neceſſary for a road to croſs the ſcreen, it ſhould either be turned about half a point from the direction of the current, or be made to bend ſo far that the wind, driving in a ſtraight direction, will loſe its force among the trees. It is almoſt unneceſſary to add, that ſuch roads ſhould be no wider than what is ab-

ſolutely neceſſary; for, otherwiſe, they would not only hurt the general effect, but alſo occaſion a degree of expoſure. In narrow ones, by a little attention, the trees may be made to arch over at any given height; ſo that a matter of convenience may be made productive of variety.

In cloſing this ſubject, I may obſerve, that not only elevated ſituations require ſhelter, but any bare one may be greatly benefited by it. Any one, who has clear ideas of agricultural affairs, muſt know that it is highly valuable; but none who have not experienced it, can juſtly eſtimate its extent. The beſt proof, that I can advance, of its worth, is the opinion of the noble poſſeſſor of Stanmer, before mentioned. This attentive obſerver has himſelf aſſured me, that, in conſequence of the ſhelters, he conſiders many of his fields of three times the value they otherwiſe would be: while others, not ſo fa-

vourably ſituated, appear evidently to be benefited in proportion to the ſhelter. Neither is there much danger of miſtake in this reſpect; as the eſtate is large, and affords numerous ſituations *ſtill expoſed*, the natural circumſtances of which correſpond exactly with ſuch as are ſheltered; and, therefore, the rent each would let for, clearly aſcertains the value of the ſhelters.

I have been the more particular on this head, becauſe it appears this part of the ſubject is more imperfectly underſtood than moſt others. Indeed, from a pretty extenſive knowledge of what is doing in the country, in the buſineſs of planting, there ſeems to be abundantly more need of *directions* than *incitements:* and the better a perſon underſtands the ſubject generally, and that of ſcreens in particular, ſo much clearer will be his views of the general utility of the purſuit.

It is certainly a matter highly conſolatory, to find ſo conſiderable a number of opulent perſons, in different parts of the united kingdom, exerting themſelves to provide a ſupply of timber for our increaſing wants; and more particularly ſo, to find the prejudices, in regard to fir timber of home produce, very much upon the decline. If it is true, that we can grow ſuch timber, proper for every purpoſe to which the foreign has uſually been applied, it is ſurely matter of national diſgrace *not to know it;* at leaſt, the circumſtances of the preſent moment imperiouſly demand, that the queſtion ſhould be determined, *yea or nay.*—In the preſent publication, as well as in the "FOREST "PRUNER," it has been a leading object with the author, to aſſiſt the reader in forming juſt ideas on this ſubject; and perhaps the ſamples, preſented with this treatiſe, may, in ſome degree, tend to the ſame good purpoſe. Indeed I ſuſpect,

that if many of thoſe who are moſt active in depreciating Britiſh produce, were called upon to examine theſe ſamples, without knowing them to be ſuch; they would find themſelves in the ſituation of the woodman, mentioned in page 62. But thus it muſt always happen, ſo long as men are content to take their opinions upon truſt.

The practice of confiding in commonly received opinions, without examining either their truth or tendency, is what the author has never adopted; becauſe he is fully aware, it tends to the excluſion of every idea of improvement; he believes it is to a conduct directly the reverſe, that he is indebted for whatever ſucceſs has attended him, either as a profeſſional man or as an author; and hence, upon the preſent occaſion, he has ſtrictly perſevered in it. He can, at leaſt, ſay with confidence, that he has done his duty, in uſing

his beſt endeavours to elucidate the principles, improve the practice, reduce the expence, and increaſe the value of general planting.

I have juſt been favoured with the QUERIES of the Commiſſioners of Woods and Foreſts, (dated the 21ſt of Dec. inſt.) "*relative to the Cul-*" *tivation, Management, &c. of Navy Timber,*" incloſed in the following Note.

Sheffield-Place,
Dec. 24, 1807.

Lord Sheffield is requeſted, by Lord Glenbervie, to forward the incloſed to the perſons beſt acquainted with the management and growth of timber trees, and therefore ſends it to Mr. Pontey.

As his Lordſhip has adopted the Author's Syſtem, of managing his Oak Timber, *probably the fineſt in the Kingdom*, the above Note will

be ſufficient to exhibit his opinion of the FOREST PRUNER; and, therefore, the Author has only to expreſs his ſincere ſatisfaction, that Government *now* ſees the neceſſity of ſome meaſures to encourage the Growth and Improvement of Oak Timber. It is, indeed, the more pleaſing, becauſe the neceſſity for ſuch meaſures has not only been pointed out by himſelf, but, *enforced* by arguments, that he preſumes to be unanſwerable, in the above work, (publiſhed in 1805,) p. 262—270.———The book is of itſelf a ſatisfactory ANSWER to many of the Queries alluded to.

POPLARS.

Mr. Liddell, Agent to Sir Thomas Pilkington, of Chivett, near Wakefield, has juſt favoured me with the following particulars, which I conſider of much importance; as, while they demonſtrate the quickneſs of growth, they alſo prove the peculiar propriety of uſing means, to aſcertain the *uſeful application* of ſuch articles.

A Black Italian Poplar, planted in Mr. Liddell's Garden, at New-Miller-Dam, near Wakefield, in the ſpring of 1799, and then only ſix feet high, is now thirty-eight; the Trunk being twenty, and

the Top eighteen feet. The average Girt of the former being twenty-four Inches. This tree loft about feven feet, from its top, in the fummer of 1802.

Another Poplar, of the fame fpecies, planted in the fame Garden, in March, 1801, had about ten feet cut off its head, after two years' growth, at eight feet and a quarter high, to prevent its damaging fome fhrubs; after which, it produced three branches, which now form as many diftinct heads, at the above height; the leaft of which is twenty feet long. The Girt of the Trunk is twenty-four inches.——The *fituation* of this Garden is rather elevated, the foil LIGHT and DRY.

Another Poplar (of the common white fpecies, or what is called in fome places, the White Willow,) growing on the banks of the river Calder, near Wakefield Mills, planted fourteen years ago, being then about the fize of a common walking cane, is now of the following dimenfions.

The Height fifty-feven feet.
Average Circumference, to eight feet high, fixty-four inches.
Ditto ditto from eight to twenty ditto, forty-eight ditto.

From the trunk, at eight feet high, it has fent out an arm or branch, which is twenty-four inches in circumference and about thirty-five feet long; the whole containing not lefs than THIRTY CUBIC FEET OF TIMBER.

Though all the above may be confidered as aftonifhing inftances of quick growth, the laft gives the cleareft refult; as having come to an age and fize in which trees, of this defcription, may be faid to feed in trunk, rather than expend their ftrength in top.——A fcale of progreffive increafe would certainly ftate the produce of the laft year at not lefs than fix or feven feet of timber.——The hiftory of this tree is as fingular as its increafe is *aftonifhing*:—It was found floating in the river!

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to 40s per hundred — Above ten
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and rafters for cattle-sheds.

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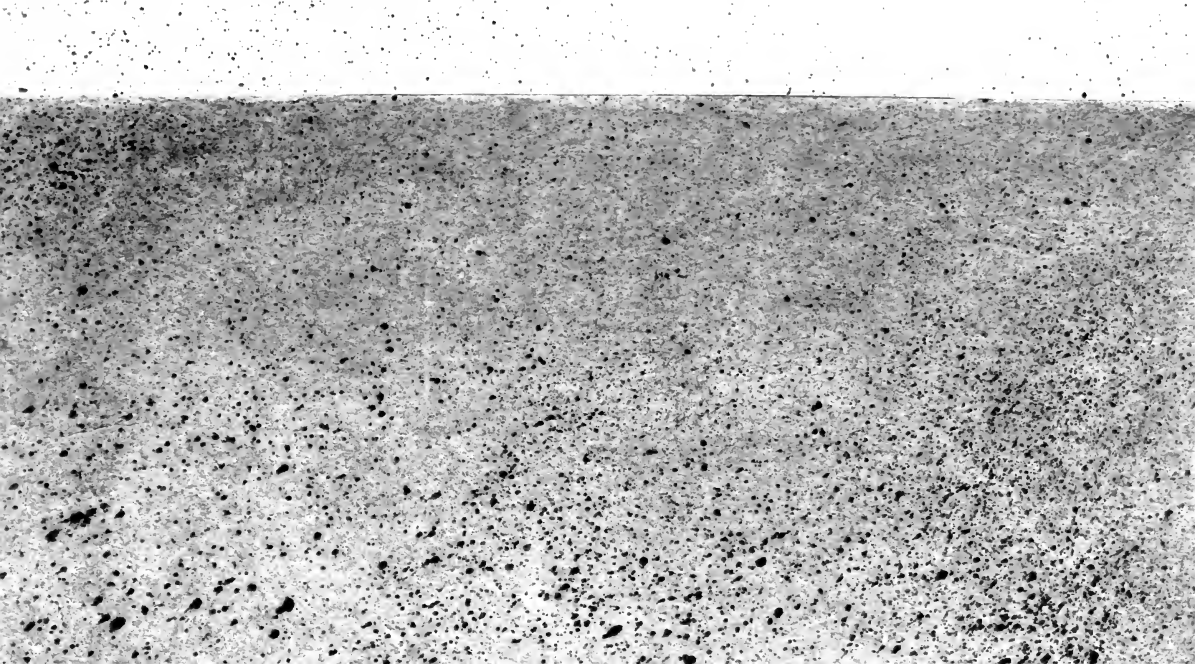
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